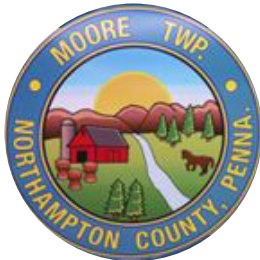
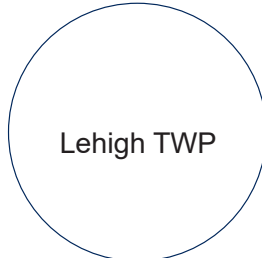
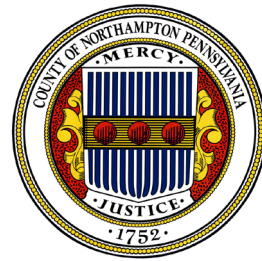
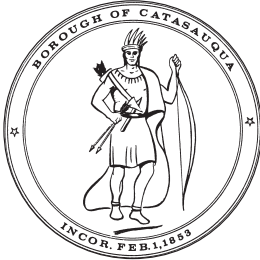




# Lehigh Valley International Airport (LVIA) Area Freight Study



# Lehigh Valley International Airport Area Freight Study

## Final Report

**Prepared for:**

**Lehigh Valley Transportation Study (LVTS)/PennDOT**

961 Marcon Blvd., Suite 310

Allentown, PA 18109

(610) 264-4544

[www.lvpc.org](http://www.lvpc.org)

**By:**

**Michael Baker International, Inc.**

4431 N. Front Street

Harrisburg, PA 17110

(717) 213-2900

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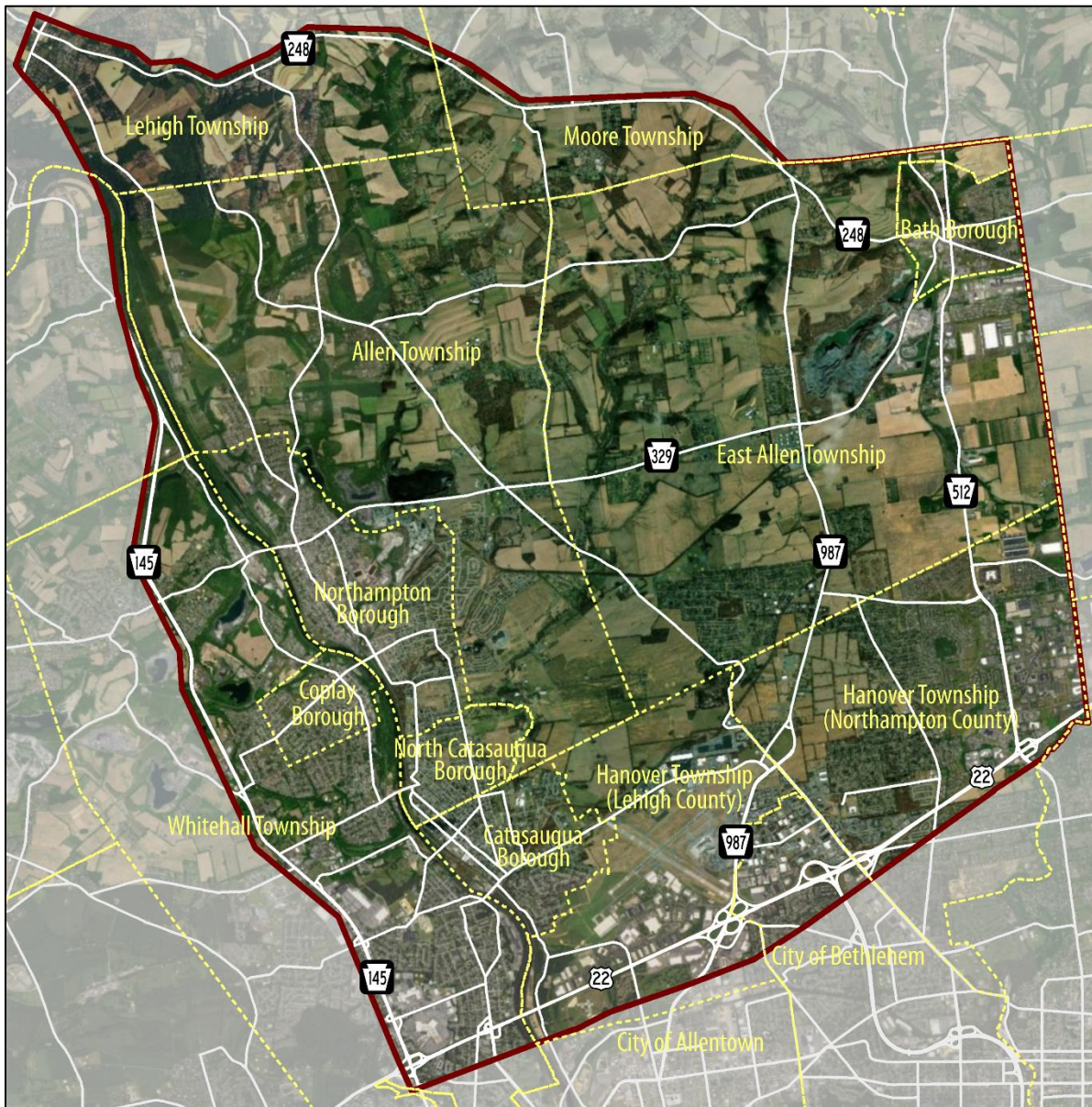
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### Lehigh Valley International Airport Study Area



#### LVIA Area Freight Study - Geographic Context

- Bounded by US 22 on the south, PA 512 on the east, PA 248 to the north, and PA 145 on the west.
- Approximately 29,000 acres in size, including 13 municipalities in both Lehigh and Northampton counties.
- Positioned near the geographic center of the Lehigh Valley.
- Approximately 100 miles west of the Port of New York/New Jersey and 70 miles northwest of the Port of Philadelphia (PhilaPort).
- Encompasses several of the top 100 freight-generating locations in the state.
- Includes a segment of US 22, which is part of the National Highway Freight Network and one of the top truck bottlenecks in Pennsylvania.

## Study-Area Infographics: By the Numbers

### Land Area



**29,000 acres**  
*(45 square miles)*

### Municipalities



**13**

### Population



**173,329**  
*(including Bethlehem)*

### Freight-related Jobs



**19,000**

### Share of Land Devoted to Warehousing/Manufacturing/ Industrial Uses



**11.3%**

### Approved Warehouse Development (MSF)



**4.1**  
*(an additional 3.0  
has been proposed)*

### Recommended Truck Corridors



**9**

### Miles of Recommended Truck Corridors



**37.9**

### Peak Hour: New Truck Trips Generated



**2,927**

## Study-Area Chronology

While the following listing of study-area milestones is not exhaustive, it does illustrate the outsized and growing role of the study area as a driver for economic development, job creation, and commercial vehicle travel within the broader Lehigh Valley region. Global trends have also contributed to changes within the study area, including the rise of e-commerce, the expansion of the Panama Canal, the raising of the Bayonne Bridge, and the dredging of the Delaware River, to cite a few examples. These developments have all sparked increases in freight volume. The study area's strategic position within the Lehigh Valley, the state, and the nation means that planning for land use and transportation infrastructure will remain an ongoing need.

Event	Date
Lehigh Valley International Airport begins operations	1929
Of impact to study area, Pennsylvania General Assembly passes Act 89, generating \$2.3 billion from higher gas taxes and motorist fees	November 2013
Rockefeller Group multi-warehouse complex (3) approved, totaling 2.4 million square feet in Allen Township (includes 1.1 million square feet for FedEx Ground and \$40M for roadway improvements)	August 2015
Work begins on a \$65 million project to widen US 22 to six lanes from MacArthur Road east to the Lehigh River	September 2015
Panama Canal expansion completed at a cost of \$5.25 billion, accommodating container ships up to 13,000 20-foot equivalent units (TEUs) in size	June 2016
FedEx Ground breaks ground in Allen Township on a \$330 million freight hub, which opens in September 2018	August 2016
Northampton Business Center multi-warehouse complex (6) proposed in Allen Township, totaling 2.4 million square feet; Century Commerce Plaza multi-warehouse complex (3) approved, totaling 1.65 million square feet	December 2017
In the U.S., e-commerce sales as a percentage of total retail sales exceeds 10% for the first time	2018
The Commonwealth passes Act 31, allowing 102-inch-wide trailers on all public roadways; LVTS, DVRPC, and TCRPC host Pennsylvania's first-ever freight summit in Bethlehem; Liberty Trust begins construction of Century Commerce Plaza; Grace Industries begins construction of Airport Road Lot #1	June 2018
Rockefeller Group begins construction on Rockefeller Group Logistics Park, a 1.3-million-square-foot distribution center complex (2) in Allen Township	October 2018
Work begins on \$5 million widening of Airport Road	June 2019

### Acknowledgements

The Lehigh Valley Transportation Study thanks the following individuals for their constructive and active review of draft meeting materials and participation throughout the study process. The following individuals provided the voice of the community in the development of this final study report.

#### **Steering Committee**

##### **Members**

##### **Eugene Clater**

Allen Township

##### **Brad Flynn**

Borough of Bath

##### **Mark Saginario**

Borough of Bath

##### **Steve Travers**

Borough of Catasauqua

##### **William Molchany, Jr.**

Borough of North

Catasauqua

##### **Thomas Reenock**

Borough of Northampton

##### **Victor Rodite**

Borough of Northampton

##### **Darlene Heller**

City of Bethlehem

##### **Rick Molchany**

County of Lehigh

##### **Michael Emili**

County of Northampton

##### **Lamont McClure**

County of Northampton

##### **Brent Green**

East Allen Township

##### **Chris Garges**

Hanover-Lehigh County

##### **Bob Heimbecker**

Hanover-Lehigh County

##### **Jay Finnigan**

Hanover-Northampton

County

##### **Ryan Meyer**

Lehigh Northampton Airport

Authority

##### **Alice Rehig**

Lehigh Township

##### **Tom Stoudt**

Lehigh Northampton Airport

Authority

##### **Jim Pennington**

Lower Nazareth Township

##### **Dan Piorkowski**

Moore Township

##### **Bob Dolan**

PMTA/XPO/Freight Advisory

##### **Robert Toedter**

RT Consulting & Engineering

##### **Jason Toedter**

RT Consulting & Engineering

##### **Mike Harakal, Jr.**

Whitehall Township

##### **Lee Rackus**

Whitehall Township

##### **Peter Terry**

Whitehall Township

#### **PennDOT Staff**

##### **Chris Kufro**

PennDOT District 5-0

##### **Brian Hare**

PennDOT Central Office

##### **Michael Rimer**

PennDOT Central Office

##### **Dennis Toomey**

PennDOT District 5-0

##### **Scott Vottero**

PennDOT District 5-0

#### **Lehigh Valley Planning**

##### **Commission Staff**

##### **Becky Bradley**, Executive

Director

##### **Michael Donchez**

##### **Charles Doyle**

##### **Chandra Parasa**

#### **Consulting Team**

##### **Brian Funkhouser**, Project

Manager

##### **Jamie Lemon**

##### **Dan Szekeres**

##### **Tracey Vernon**

## Executive Summary

### **Why did we conduct this study?**

The increase in the number of proposed and approved warehouses in the Lehigh Valley has drawn the attention of planners, state and local officials, and the public. These large structures, coupled with increased freight movement in general, have served to make the Lehigh Valley one of the fastest-growing freight markets in the world. The growth in e-commerce has revolutionized retail and spurred the growth of these massive, freight-generating land uses.

The area around Lehigh Valley International Airport (LVIA) just north of Allentown has become the latest frontier in the burgeoning market for warehousing and distribution centers within the Lehigh Valley, with four major new land developments approved during 2018. FedEx Ground, the largest of the four, is that company's largest distribution center in the U.S. The development includes an 800,000 square foot facility (with a planned expansion to 1.1 million square feet), and includes two additional warehouses for a combined 2.4 million square feet of space. Farther to the north, Jaindl Watson Land Company has proposed building 2.4 million square feet in warehouse space. Local officials have also approved plans for Century Commerce Plaza, which will add an additional 1.65 million square feet of space across three separate buildings. As the study process was concluding in the first half of 2019, Majestic Realty Company announced that it would be developing 350 acres of the "airport flight path" properties adjacent to LVIA with spec construction.

The arrival of these freight-generating uses has enormous implications for the surrounding roadway network. Rockefeller and FedEx have contributed \$30 million in private-sector money toward improving certain roadways adjacent to their developments in order to compensate for the added traffic. Additionally, Liberty Trust, Jaindl-Watson, and Grace Enterprises (Airport Road Lot #1) have contributed or are bound to commit an additional \$10 million in private money toward roadway improvements associated with their developments. Other roadways "downstream" from these major freight generators will experience the strain from accommodating the cumulative traffic volume impacts, even though they may be miles away and in different municipalities.

The implications are clear. These developments are merely a sample of the activity taking place within the study area, yet they all attest to the Lehigh Valley's red-hot commercial real estate market. If not properly planned for, these major new land developments (and others under speculation) could overwhelm the area's already-strained transportation network, particularly cumulative traffic proceeding south through the study area to access US 22. The intent of this freight study is to develop strategies for diverting traffic, identifying needed roadway and bridge improvements, and recommending changes in local land use policy to prevent future freight-related land developments from overburdening the area highway network. For the region to be successful, transportation planning must be performed in tandem with land use planning. In other words, land developments need to be considered within the context of available supporting infrastructure.

### **What was studied, and how?**

The formal study area generally included the area immediately surrounding LVIA and included 13 municipalities in both Lehigh and Northampton counties. The study area is roughly bounded by PA 145, PA 248, PA 512, and US 22. The latter roadway is an urban freeway and serves as the Lehigh Valley's

Main Street. US 22's role as a significant freight corridor has been recognized by the Federal Highway Administration (FHWA), which has placed it on its National Highway Freight Network (NHFN), making it eligible for federal freight funding and grants.

The study team collected information concerning the study area through a series of roundtable discussions with economic development officials. The team also conducted one-on-one interviews with municipal officials throughout the study area. Finally, a 24-member steering committee met four times over the course of the study to provide input on draft products and serve as a sounding board to the Lehigh Valley Transportation Study's (LVTS) planning staff.

The planning team drew from available traffic impact studies from the study area's major land developments, and calculated anticipated new trips that would be generated based on existing municipal zoning ordinance provisions (taking into account lot size, permitted use, setback distances, etc.). Trips were then distributed across the study area roadway network using Longitudinal Employer-Household Dynamics (LEHD) and Geographic Information Systems (GIS) data to determine which segments and intersections would operate at acceptable levels of service over time. The analyses focused on two indices for measuring the extent of future traffic congestion against two scenarios: the Travel Time Index and the Planning Time Index. These indices are described elsewhere in this report.

### What were the study results?

The study produced recommendations of various types, including capital improvements, operational improvements, and changes in land use policy. The study concluded that clearly, multi-municipal and even regional approaches are needed in order to solve the land use-transportation planning challenge. LVTS and the Pennsylvania Department of Transportation (PennDOT) District 5-0 are the two agencies in the best position to spearhead this challenge.

- 1. LVTS should monitor the anticipated impacts to capacity and free-flow speed on the primary roadway segments identified through the study process. LVPC and PennDOT District 5-0 should use the land development and HOP process to study and complete improvements at the time of development.** These include the following major roadway segments, which are expected to experience significant declines in levels of service and should be added as candidate projects to the region's Long-Range Transportation Plan:
  - a. Schoenersville Road (SR 1009) between PA 987 (Airport Road) and US 22.
  - b. Race Street (SR 1004) between Airport Road (PA 987) and Fashion Drive.
  - c. Airport Road (PA 987) between US 22 and PA 329.
  - d. PA 329 between Airport Road (PA 987) and MacArthur Road (PA 145).
  - e. MacArthur Road (PA 145) between PA 329 and Columbia Street.
- 2. Expand fixed-route and deviated public transportation service in the study area.**
- 3. Upgrade Mill Street as a truck route.**
- 4. Raise the signal heads/signs at the intersection of PA 987 (Airport Road) and SR 3014 (Hanoverville Road) in East Allen Township.**

5. It is recommended that East Allen Township revise its Official Map to include a corridor linking PA 329 to Weaversville Road (SR 3017).
6. Ensure that funding for improvements is secured from developers and other stakeholders to realign Weaversville Road (SR 3017) and improve its connection to PA 987.
7. Promote the adoption of Act 164 Airport Hazard Zoning.
8. Adjust performance standards in municipal zoning ordinances.
9. Implement a Recommended Truck Route Network as a planning tool.
10. Address noise reduction.
11. Pursue functional classification upgrades on PA 329 and PA 987 from Minor Arterial to Principal Arterial.
12. Consider creating a Transportation Development District (TDD) or a Transportation Impact Fee District.

### **Who led the study?**

LVTS worked with Michael Baker International, a Pennsylvania-based transportation planning and engineering consulting firm, to conduct the study. A project management committee, consisting of staff members from LVTS and PennDOT District 5-0 and Central Office, met bi-weekly to guide the study process.

### **What happens next?**

The development of the region's \$2.73 billion long-range transportation plan (LRTP) coincided with that of the LVIA Area Freight Study report. Projects flowing out of this study will be considered for placement in the updated LRTP, as well as the 2021 Transportation Improvement Program (TIP).

Note that a candidate project's listing in the LRTP does not guarantee future funding—it is only the first step in ensuring that a candidate project can ultimately be considered for a future four-year TIP. The MPO's current TIP includes more than \$534 million to fund more than 100 road, bridge, trail, bicycle, pedestrian, and transit projects and plans.

### **Who paid for it?**

LVTS funded the study through a grant from PennDOT.

### Introduction

The Lehigh Valley Transportation Study (LVTS), as the Metropolitan Planning Organization (MPO) for the Lehigh and Northampton County region, initiated this study in response to growing development pressure within the Lehigh Valley International Airport (LVIA) study area.

Recent plans conducted by PennDOT indicate that goods movement within the Lehigh Valley is expected to mushroom from a 2011 total of 39 million tons to 75 million tons by 2040. Approximately 90 percent of this freight is being carried by truck, underscoring the importance of the region's roadway network to the safe and efficient movement of freight.

The study area encompasses 13 municipalities and includes the airport as a major regional freight hub within the Lehigh Valley. The study area is approximately 45 square miles in size with approximately 350 linear miles of state- and locally-owned roadways.

The study area is experiencing a sharp increase in major land speculation, development, and investment in transportation infrastructure. Since 2013, 26.2 million square feet of new warehouse and distribution center space has been approved by municipal officials in the two-county region (while over that same time period, 11.7 million square feet has been *proposed*, but not approved). Since 2013, in the LVIA Freight Study Area, 4.1 million square feet of new distribution and warehouse space has been approved; 3.0 million square feet has been proposed, but not approved. Growth is further evidenced by the Lehigh Valley MPO's total four-year spending plan, nearly a quarter of which (\$97 million) has been programmed for improvements within the study area. This figure does not include an additional estimated \$40 million in private sector funding.

Even during the relatively short duration of the study (12 months), there were several significant events that had repercussions on the study process and its outcomes:

- “Transportation and Warehousing” became the Lehigh Valley’s fifth-largest employment sector (surpassing Education), with over 25,000 jobs.
- “Northern Lights” – The study area has been experiencing an increase in commuter traffic, with more workers from Carbon County commuting into the Lehigh Valley for employment. Much of this traffic is destined to points south using study area roadways such as PA 248, Indian Trail Road, and Cherryville Road.
- LVTS, along with the Tri-County Regional Planning Commission and Delaware Valley Regional Planning Commission, hosted Pennsylvania’s first-ever freight summit in June 2018, with more than 225 participants representing all levels of government and the private sector. The summit addressed issues ranging from truck parking to land use to the changing needs of the labor force. It was agreed that regional perspectives and solutions are needed in planning for increases in freight transportation.
- Also in June 2018, the Commonwealth passed Act 31, which allowed 102-inch-wide trailers to operate on all roadways. As this study was underway, PennDOT completed engineering and traffic operations studies to determine which roadways should remain restricted to these large commercial vehicles.

- The Lehigh Valley International Airport was in the process of developing a new master plan to address growth in both cargo and passenger traffic.<sup>1</sup> In January 2018 the airport sold three lots along Willowbrook Road totaling more than 100 acres for \$4.5 million. A lot on the west side of the roadway is set to accommodate another million-square-foot warehouse, while a lot north of the FedEx site would host a 291,000-square-foot warehouse.
- The FedEx Ground hub underwent construction in Allen Township, generating strong interest from developers looking to build industrial projects near that site. FedEx will initially employ 800 workers at the new 1.166-million-square-foot facility.

New proposals, such as the development of the “airport flight path” properties by Airport Road in Hanover Township (Northampton County) were coming online even as the study process drew to a close. As pressure for warehouse and distribution center development has increased, it has put a greater burden on study-area roadways as well as the “gateway” communities between the study area and the larger Lehigh Valley region. How the study area interacts with the rest of the state, nation, and world has a direct impact on communities such as Bath and Hanover Township (Northampton County), as well as on the roadways that provide access from US 22 to the study area’s developing interior. The study process examined development trends, convened stakeholders, and developed a series of recommendations for projects and policies to help inform future planning and programming by LVTS and its partners.



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<sup>1</sup> The airport has 7 to 8 cargo flights daily.

### Profile of Existing Conditions

#### Roadway Network

The study area is criss-crossed by approximately 350 miles of both state- and locally-owned roadway. US 22 is the highest-order roadway serving the area, directly connecting motorists and motor carriers to destinations in New Jersey and New York City, as well as Harrisburg. US 22, also known as the Lehigh Valley Thruway, skirts the southern extent of the study area. It is also a part of the National Highway System (NHS), a federal designation created by Congress in 1995 as part of the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) four years earlier. US 22 is a limited-access facility and an urban expressway, and features six interchanges within the study area: at MacArthur Road (PA 145), Fullerton Avenue (SR 1015), Airport Road (PA 987), Fred B. Rooney Highway (PA 378), Schoenersville Road (SR 1009), and Center Street (PA 512). It is a strategic roadway serving not only the travel needs of the study area but the greater Lehigh Valley region. It is an alternative to Interstate 78 and provides redundancy on the network when there is an incident on the interstate. The roadway sees the highest traffic volumes in the Lehigh Valley region, and portions of it exceed 25 percent truck traffic.

LVTS identified US 22 as a potential candidate for inclusion on the federally-designated National Multimodal Freight Network (NMFN), considering US 22 as a Critical Urban Freight Corridor (CUFC). (In addition, the MPO submitted a portion of PA 987 (Airport Road) between US 22 and Schoenersville Road as a candidate for consideration.) FHWA certified the proposed segments on February 28, 2019, thus making them eligible for federal freight funding and grants.<sup>2</sup>

Other primary roadways within the study area include the PA-signed routes of PA 145, PA 248, PA 329, PA 512, and PA 987, and a series of lower-order “SR” roadways.

LVTS has classified many of the remaining roadways in the study area as minor arterials. These roadways are generally designed for lower speeds and serve more local trip purposes. They augment the principal arterials and place more emphasis on land access, and thus offer a lower level of traffic mobility.

Given their functionally local classification, Indian Trail Road and Old Carriage Road could be considered as candidates for PennDOT’s Turnback Program. Through this program, PennDOT would provide the municipalities with an annual maintenance payment of \$4,000 per turnback mile<sup>3</sup> in exchange for ownership. Roadways that are functionally classified as “local” provide service to travel over relatively short distances and are not generally on the Federal Aid System—the system of roads eligible for federal financial assistance for maintenance and repair.

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<sup>2</sup> The National Multimodal Freight Network (NMFN) is a creation of the FAST Act, which was passed by Congress in December 2015. The NMFN is the primary subject of federal freight investment.

<sup>3</sup> By linear mile

Several other study-area roadways are locally-owned, yet are on the Federal-Aid System. These include portions of Hanoverville Road, Howertown Road, Irving Street, and Jacksonville Road. There are several other examples within the more built-up areas of the boroughs of North Catasauqua and Northampton.

The remainder of the study-area roadways consist of locally-owned streets and roads. They constitute the majority of the study area's total roadway mileage, and—of all roadway types—offer the greatest level of accessibility to trip origins and destinations. One major study-area roadway meeting this classification is Willow Brook Road in Allen Township and Hanover Township (Lehigh County).

A road of some distinction is Indian Trail Road (SR 3016). The portion in Allen Township is state-owned but the adjacent portion in Lehigh Township is locally owned. The roadway, along with Kreidersville Road (SR 4003), facilitates the movement of traffic to and from the broader study area and points northwest. Cherryville Road serves a similar function and has been recently posted “no trucks” by the Township.

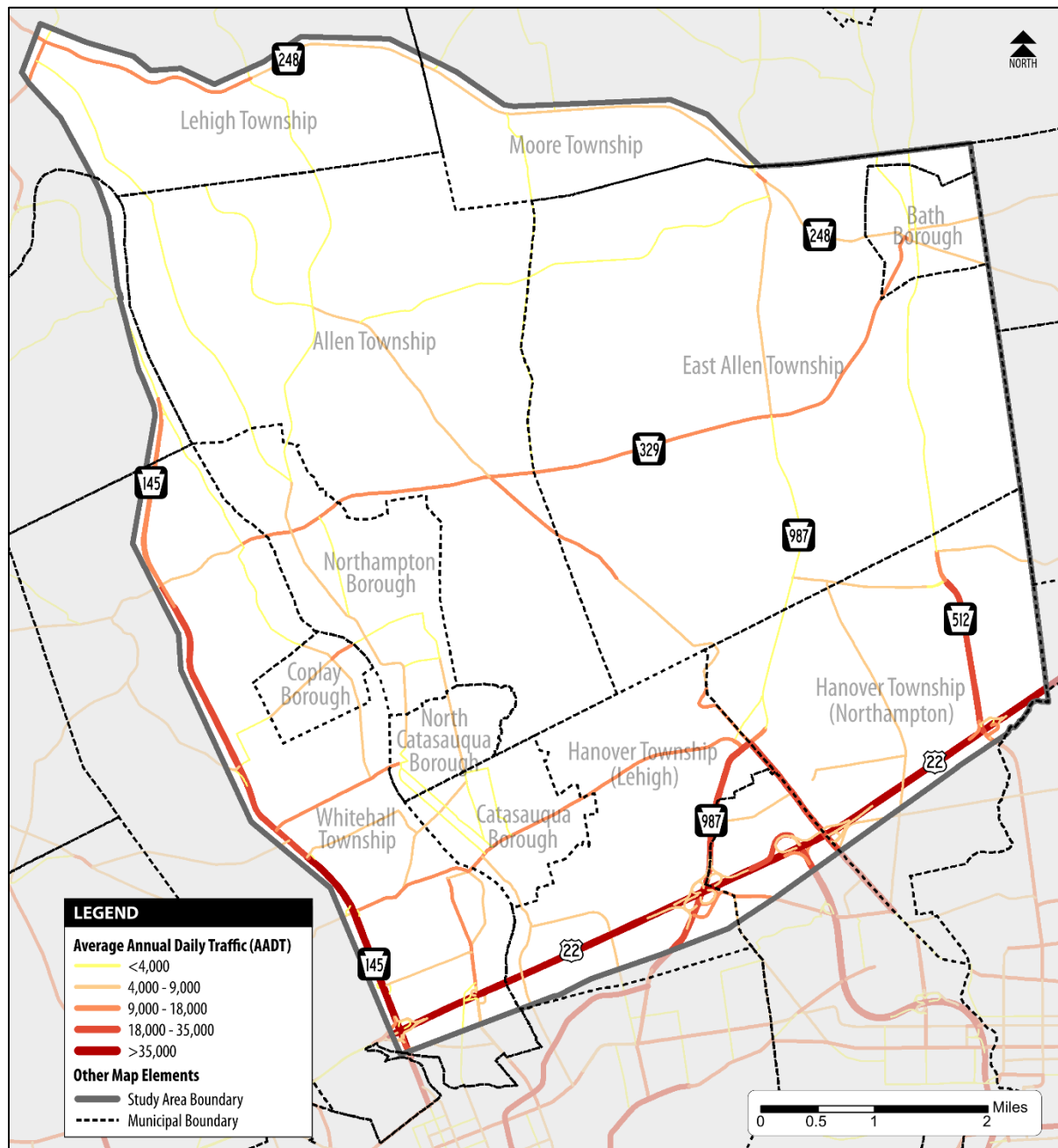


**Improvements were underway on Willow Brook Road during the study process.**

### Average Annual Daily Traffic

Within the study area, US 22 experiences the greatest amount of daily traffic with total traffic volumes now surpassing 95,000 (depicted in **Figure 1**). Major north–south state routes within the study area have moderate average annual daily traffic (AADT) values, with PA 145 (MacArthur Road) and PA 987 both carrying the highest levels of traffic off of US 22. Roadways in the northern portion of the study area are less-traveled, with the exception of PA 248, which averages roughly 8,000 vehicle trips per day.

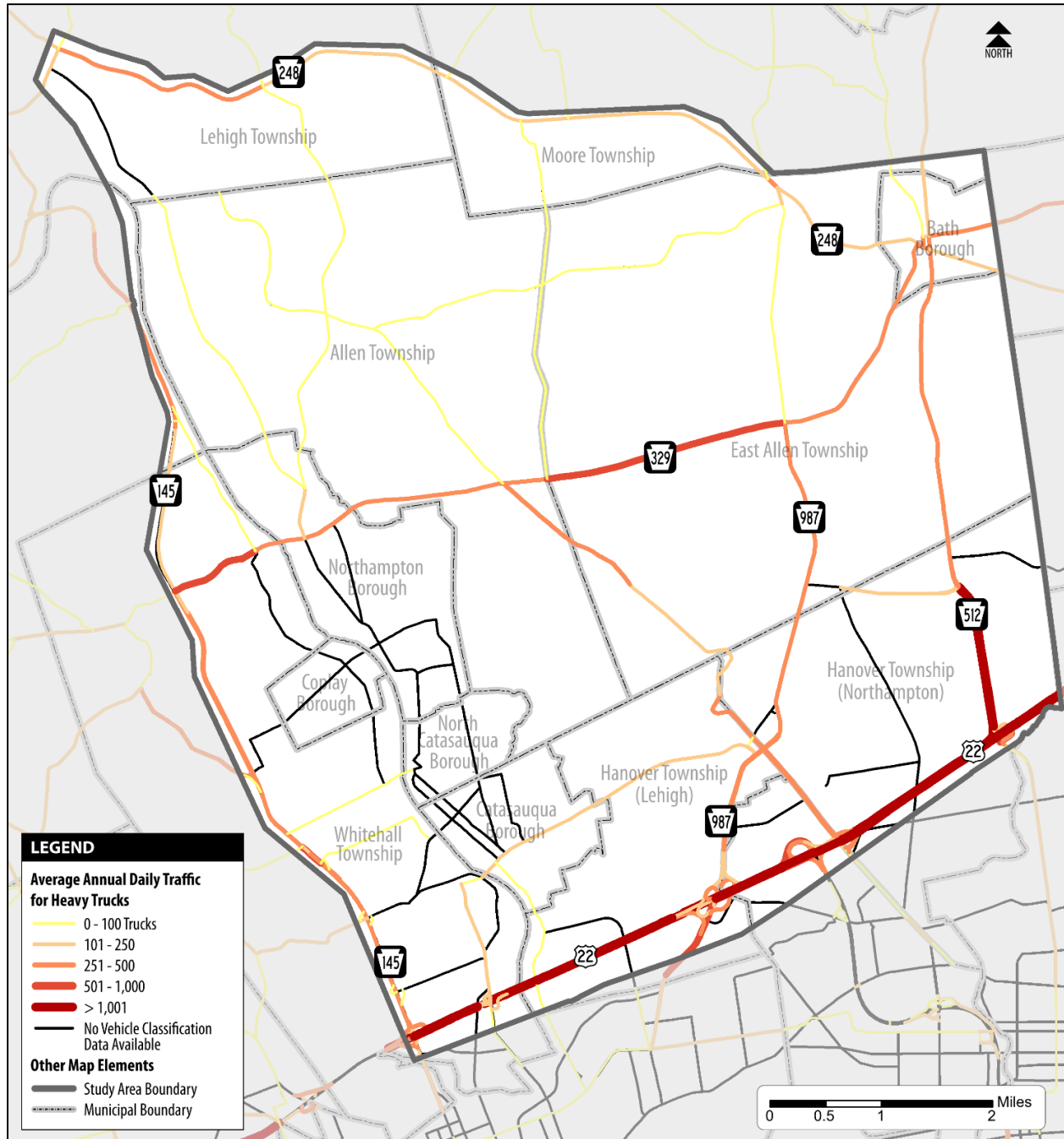
**Figure 1: Overall Traffic Volumes**



Source: PennDOT Roadway Management System (RMS)

In addition to experiencing the highest traffic volumes within the study area, US 22 also handles the greatest volume of truck traffic.<sup>4</sup> The western portion of the study area experiences significantly less truck traffic, with most roadways carrying less than 500 trucks per day (shown in **Figure 2**).

**Figure 2: Average Annual Daily Traffic for Tri-axle Trucks and Greater**



Source: PennDOT Roadway Management System (RMS)

<sup>4</sup> Heavy trucks are defined using FHWA's standardized vehicle classification:  
<https://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/13091/002.cfm>.

### Traffic Safety – Reportable Crash Data

PennDOT maintains detailed crash data sets that are derived from the information filed on each reportable crash.

MacArthur Road and the Lehigh Valley Thruway experienced the highest number of fatalities and suspected serious injuries within the study area, accounting for roughly 41 percent of the 56 fatal and suspected serious injury crashes reported over the five-year analysis period (**Table 1**).

**Table 1: Study Area Reportable Crashes – Fatalities and Serious Injuries (2013-2017)**

Roadway	SR Number	2013	2014	2015	2016	2017	5-Year Total
Lehigh Valley Thruway	US 0022	1	3	1	4	3	12
MacArthur Rd	SR 0145	2	5	0	3	1	11
Lehigh Dr/Pheasant Dr	SR 0248	2	0	1	1	5	9
Nor-Bath Blvd	SR 0329	1	3	0	2	0	6
Beth-Bath Pike	SR 0512	0	0	2	5	1	8
Airport Rd	SR 0987	0	0	1	0	0	1
Race St	SR 1004	0	2	0	0	1	3
Schoenersville Rd	SR 1009	2	0	1	0	0	3
Weaversville Rd	SR 3017	0	0	1	2	0	3
Seemsville Rd	SR 3021	0	0	0	0	0	0
Airport Rd	SR 3023	1	0	0	0	0	0

Source: Pennsylvania Crash Information Tool (PCIT) (2013-2017)

## Traffic Congestion

An assessment of traffic congestion provides a basis for identifying transportation needs and strategies to improve mobility. For the project study area, information on traffic congestion was assembled based on historical travel time data from the TomTom and INRIX providers.

TomTom travel time data was acquired by PennDOT in early 2017. The data represents average weekday peak hour travel times over a two-year period (2014-2016) from both passenger vehicles and trucks. The TomTom travel times are aggregated over small roadway segments and include many of the study area's key roadways. Despite being several years old, this data source can be used to evaluate the locations and levels of historical traffic congestion. Based on the travel time data, a travel delay measure was estimated for each road segment. The delay represents the difference between peak period (highest of AM and PM time periods) and off-peak travel times, multiplied by the total traffic volume.

Traffic volumes were obtained from PennDOT's Roadway Management System (RMS). The calculated delay values were divided by the roadway segment lengths to produce a delay per mile measure. As illustrated in **Figure 3**, the roadway connections to US 22 at the study area's southern extent experience the highest delay levels. These locations include PA 145 (MacArthur Road), PA 987 (Airport Road), and Schoenersville Road. When isolating truck volumes by segment, US 22 emerges as the corridor with the highest levels of truck delay (**Figure 4**), primarily due to the construction activities that have occurred since 2015 and the high traffic volumes. The intersections of PA 329 (W. 21st Street) and Main Street in Northampton Borough and PA 329 (Nor-Bath Boulevard) and Weaversville Road in Allen Township also demonstrate high levels of truck delay per mile, as do PA 987's intersections with PA 329 and Orchard Road.

PennDOT currently maintains access to the Regional Integrated Transportation Information System (RITIS). RITIS is an interface and reporting tool for INRIX travel time data and includes historical travel time data for every hour since 2010. As compared to the TomTom information obtained by PennDOT, INRIX includes more recent travel times and the ability to process that data in more detail. However, the INRIX reporting segments are larger with less roadway coverage in the project study area. Based on information obtained from January 1 – December 31, 2018, the following performance measures were evaluated:

- Travel Time Index (TTI) = (Average Travel Time) / (Free-Flow Travel Time)

TTI provides a measure of traffic congestion. Values higher than 1.3 indicate moderate levels of congestion. Values higher than 1.6 indicate heavier or more severe traffic conditions. The average travel time represents the 50th percentile condition for all weekdays. Therefore, these values represent the conditions that can be expected on most weekdays.

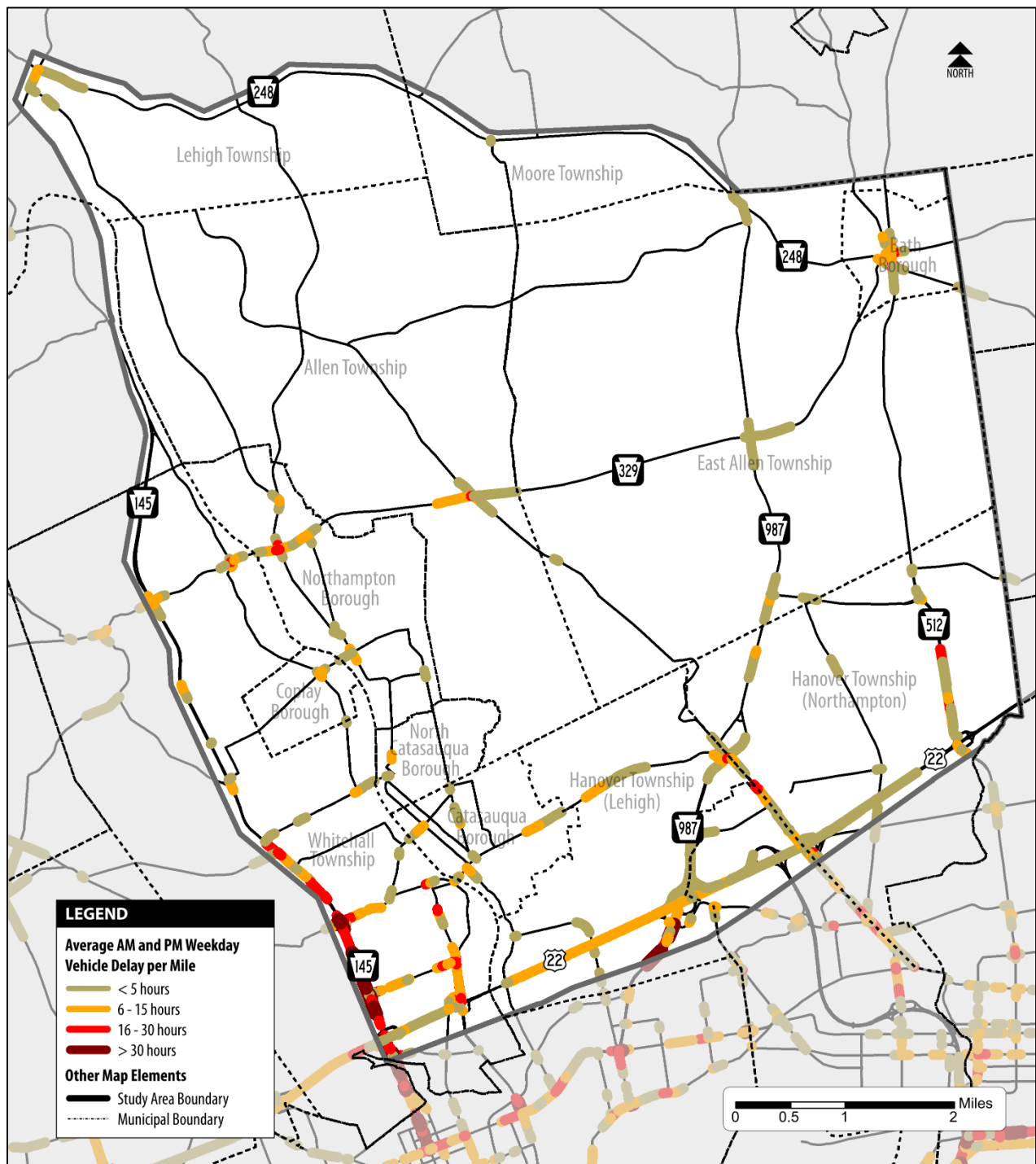
- Planning Time Index (PTI) = (95<sup>th</sup> Percentile Travel Time) / (Free-Flow Travel Time)

PTI is a ratio of the near-worst travel time to light or free-flow conditions. This measure is often used to assess traffic reliability, indicating whether traffic congestion is highly variable. This measure may be highly impacted by traffic incidents, peak days of freight or airport access in the study area, or construction activities. Values higher than 2.5 generally indicate unreliable conditions.

**Figure 5** spatially depicts the study area's TTI values for the PM (4:30-5:30 p.m.) peak hour.

## Lehigh Valley International Airport Area Freight Study

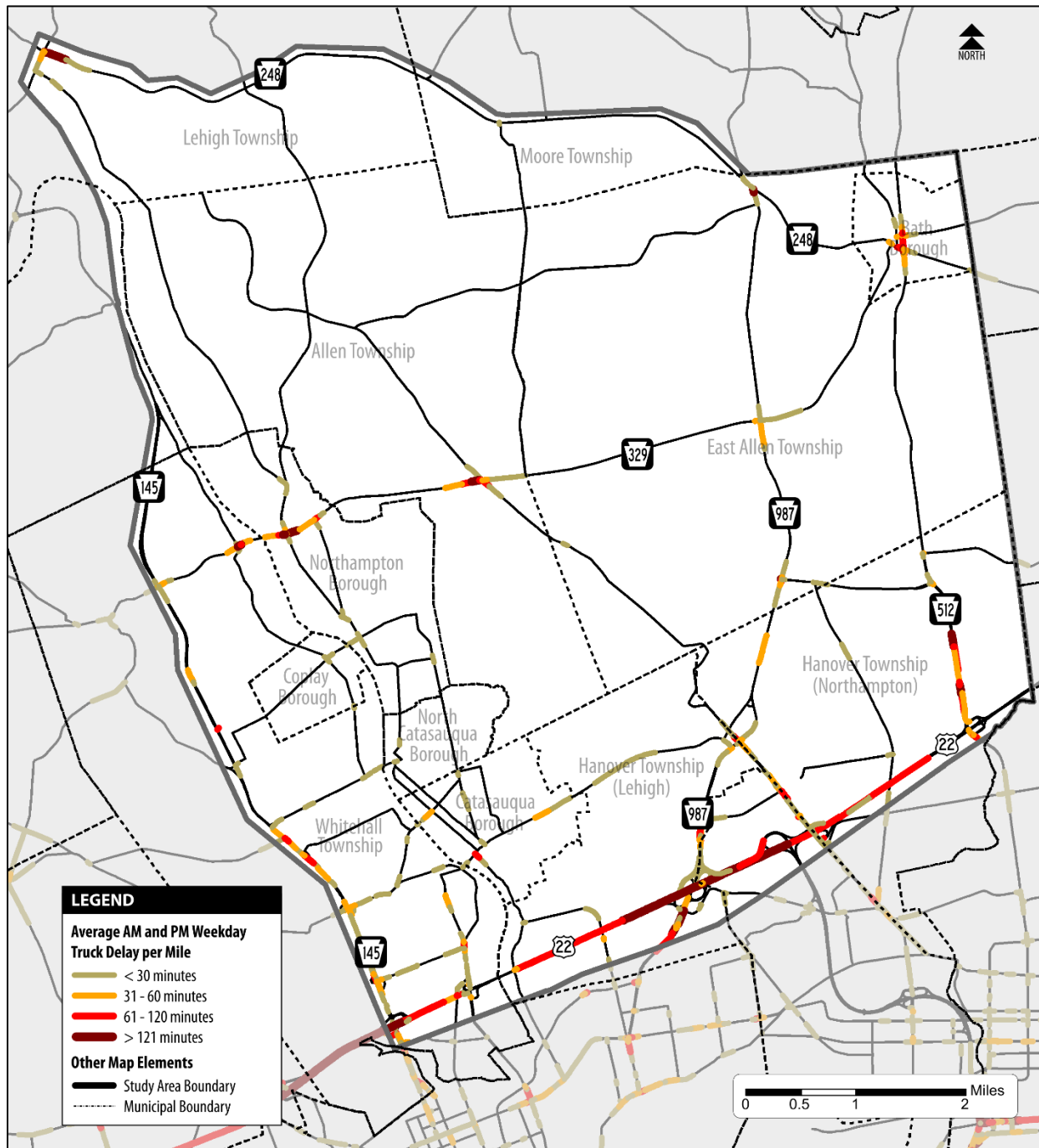
Figure 3: Average Weekday Vehicle Delay per Mile (2014-2016)<sup>5</sup>



Source: TomTom Average Weekday Travel Times and PennDOT RMS Traffic Volumes

<sup>5</sup> PennDOT's latest version of TomTom speed profile data is available for 2014-2016 average weekday conditions.

Figure 4: Average Weekday Truck Delay per Mile (2014-2016)<sup>6</sup>

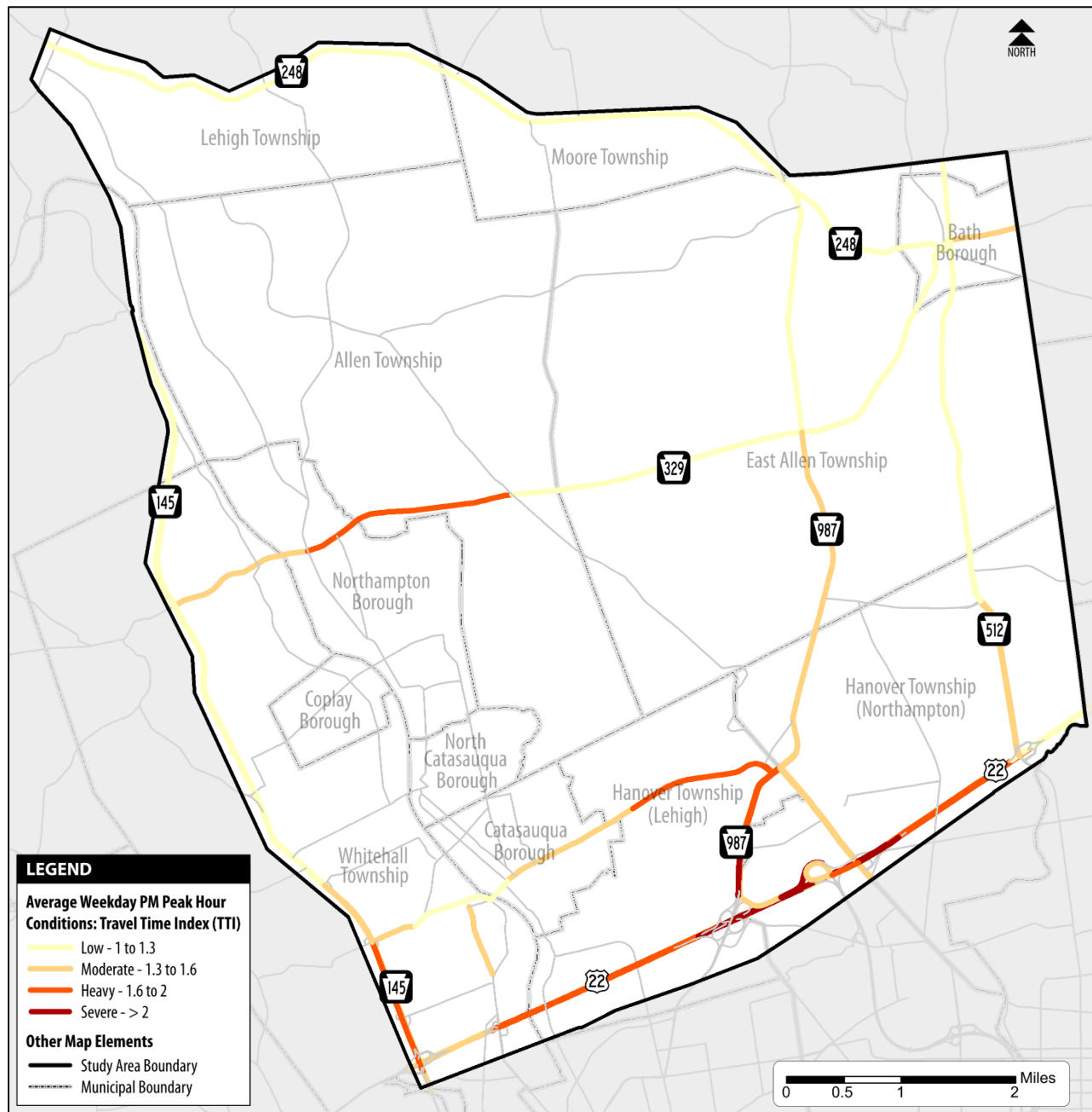


Source: TomTom Average Weekday Travel Times and PennDOT RMS Truck Volumes

<sup>6</sup> Truck delay is estimated.

## Lehigh Valley International Airport Area Freight Study

**Figure 5: INRIX Travel Time Index (TTI) for Study Area Roadways**  
(Average Weekday PM Peak Hour Conditions from January 1 – December 31, 2018)



Source: RITIS Trend Map for 4:30-5:30 using January 1-December 31, 2018 INRIX Travel Time Data

For each of the congested corridors illustrated in **Figure 5** (other than US 22), **Appendix A: INRIX Travel Time and Planning Time Index Summary** provides additional details of the average TTI and PTI values by day of the week and direction of travel. Observations related to the most congested roadway approaches in the study area include:

- MacArthur Road Southbound from Schadt Avenue to US 22 – This section has the highest overall traffic congestion (TTI) in the study area with significant variability in travel times (PTI). Traffic congestion and reliability issues are encountered during the midday and PM peak periods every day. Weekend days have higher congestion levels on average than weekdays. The Lehigh Valley Mall shopping trips are most likely a major contributor to the delays.
- Airport Road Southbound from Schoenersville Road to US 22 – Significant delays and reliability issues are encountered on weekdays during the AM and PM peak periods. PM delay exceeds AM delay on most days. Travel times are highly variable and may be impacted by airport travel and trucking activity within the study area.
- PA 329 Westbound from Howertown Road to Main Street – High traffic congestion and reliability issues primarily occur on weekdays during the PM peak period, though moderate congestion can also occur on weekdays during the AM and midday periods.
- Race Street Westbound from Willow Brook Road to Airport Road – Traffic congestion and reliability issues exist for weekdays during the PM peak period.
- Airport Road Northbound to PA 329 – This corridor is often observed to be congested from Schoenersville Road to PA 329.

**Appendix A** provides details on several other roadway approaches with moderate traffic congestion including Airport Road northbound from Hanoverville Road to PA 329, Schoenersville Road southbound from Airport Road to US 22, Jacksonville Road southbound from Hanoverville Road to US 22, and PA 248 from Maple Drive to Locust Drive.

## Planned Improvements

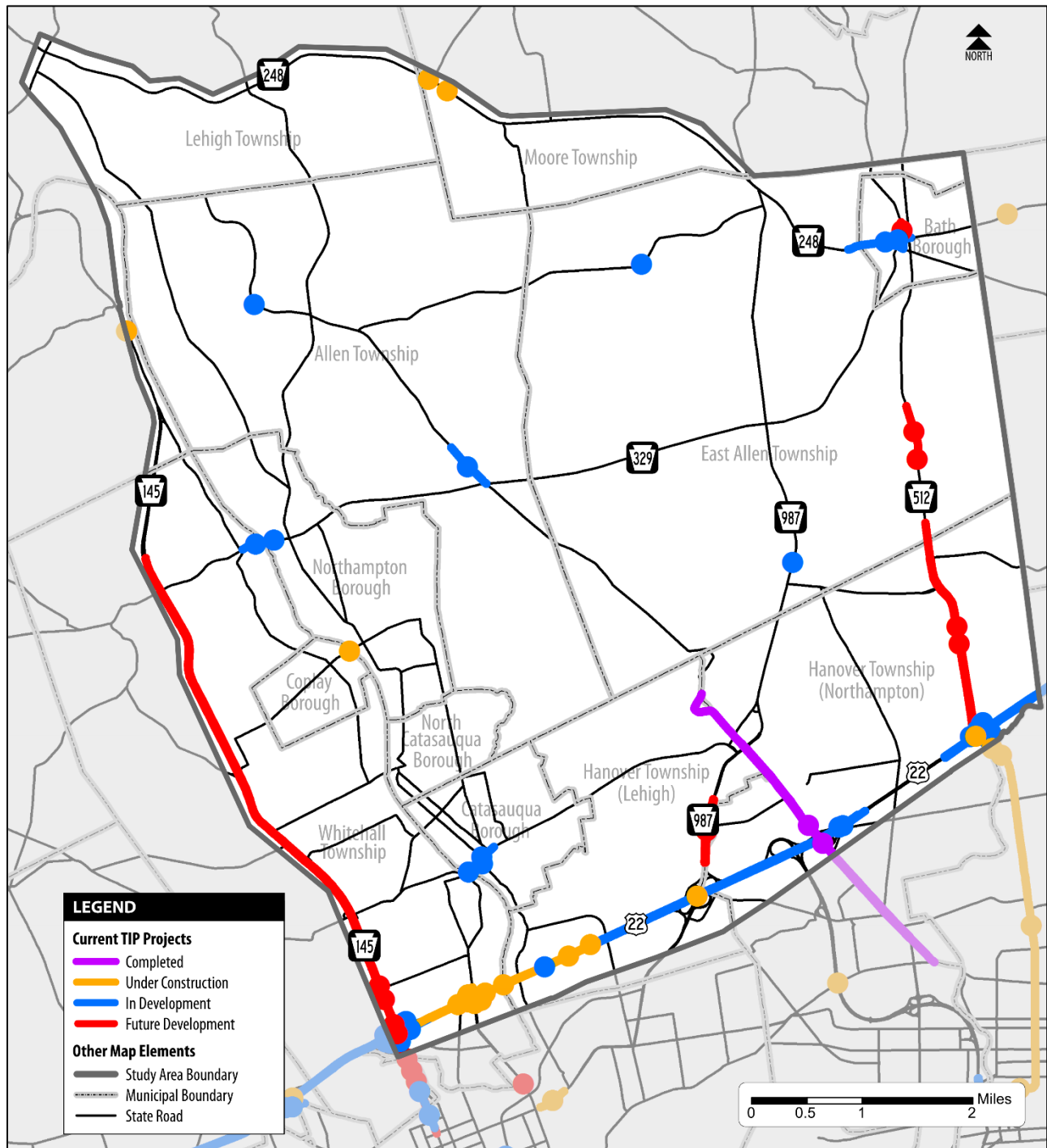
There are nearly 20 transportation infrastructure improvement projects planned within the study area, representing an investment of more than \$97 million. These projects comprise nearly a quarter of all planned highway and bridge investment within the Lehigh Valley MPO region for the four-year period ending in 2022.<sup>7</sup> Planned improvements are a mix of developer-funded and publicly funded through the MPO's 2019-2022 Transportation Improvement Program, which was approved by FHWA and the Federal Transit Administration (FTA) in September 2018.

An especially noteworthy investment within the study area is the widening to six lanes of US 22. Additional bottlenecks being addressed include the bridges over the Lehigh River (although these structures are being replaced due to age and weight restrictions, not primarily to expand capacity). In addition to addressing roadway and bridge needs, the study area's planned project mix includes a range of operational improvements, including adaptive signal upgrades and signal hardware.

**Figure 6** depicts the various projects that are planned and programmed within the study area. **Table 2** provides the detail for each.

<sup>7</sup> \$32 million of this is focused on US 22

Figure 6: 2019 Transportation Improvement Program Project Locations



**Table 2: 2019-2022 Transportation Improvement Program (TIP) Projects**

Project	Location	Type	Cost (\$000s)	Description
US 22 widening	Hanover; South Whitehall; Whitehall Twps	Widening	\$26,148	Widen to 6 lanes between 15 <sup>th</sup> Street and Airport Rd.
Cementon bridge	Whitehall Twp (L); Northampton Boro (N)	Bridge replacement	\$17,083	Replacement/rehabilitation of the Cementon Bridge carrying PA 329
Coplay/Northampton bridge	Coplay Boro; Northampton Boro	Bridge rehab	\$12,059	Replacement/rehabilitation of the Coplay-Northampton Bridge on Chestnut Street
Lehigh Race St. Intersection	Catasauqua Boro	Restoration	\$7,119	Signalization of Race Street intersections with Lehigh Street, Front Street, and Second Street. Conversion of Front Street and Second Street to two-way streets.
US 22 – Farmersville Rd. to PA 512	Bethlehem Twp	Resurfacing	\$6,171	Highway resurface/ restoration of US 22 from Farmersville Road to PA 512 mainline, and PA 191 and PA 512 interchange ramps.
PA 248 Realignment	Bath Boro	Restoration	\$5,428	Reduces the number of turning movements.
FedEx Roadway Improvements	Hanover Twp (L)	Widening	\$5,000	PA 987 widening SB from north of City Line Rd to US 22
MacArthur Rd. resurface	Whitehall Twp (L)	Hwy restoration	\$4,933	Highway resurface of MacArthur Rd. from Grape Street to PA 329.
Howertown Rd. bridge	Allen Twp	Bridge replacement	\$2,431	Replace/rehab of SR 3017 Howertown Rd. bridge
Race Street over Lehigh River	Catasauqua Boro; Whitehall Twp (L)	Bridge rehab	\$2,214	Bridge replacement of SR 1004 (Race St)
Indian Trail Rd. bridge	Allen Twp	Bridge replacement	\$1,999	Replacement/rehabilitation of the bridge carrying SR 3016 (Indian Trail Road)
PA 248 bridge rehab	Moore Twp	Bridge rehab	\$1,545	Bridge rehab of PA 248 over tributary of Hokendauqua Cr
PA 248 bridge rehab	Moore Twp	Bridge rehab	\$1,236	Bridge rehab of PA 248 over tributary of Hokendauqua Cr
MacArthur Rd. adaptive signal upgrade	Allentown; Whitehall Twp (L)	Signalization improvements	\$1,187	Adaptive signal upgrades along PA 145 (MacArthur Road) from 6th Street to Chestnut Street.
PA 512 Adaptive Signal upgrade	Hanover Twp (N)	Signalization Improvements	\$836	Adaptive signal upgrades along PA 512 from Center St to Jandl Blvd
Old Carriage Rd. bridge replacement	East Allen Twp	Bridge replacement	\$734	Replace SR 3018 Old Carriage Road bridge
Beth-Bath bridge replacement	East Allen Twp	Bridge replacement	\$655	Replacement/rehabilitation of the PA 512 (Beth-Bath Pike) bridge over tributary of Monocacy Creek

## Lehigh Valley International Airport Area Freight Study

Project	Location	Type	Cost (\$000s)	Description
Schoenersville Rd. Corridor	Bethlehem; Hanover Twp (N)	Signalization Improvements	\$393	New signal timing plans; updated signal hardware from Avenue C to 8 <sup>th</sup> Ave.
Railroad Crossing	East Allen Twp	Safety	\$284	Upgrade RR safety equipment where PA 512 crosses NS

Source: Lehigh Valley Transportation Study

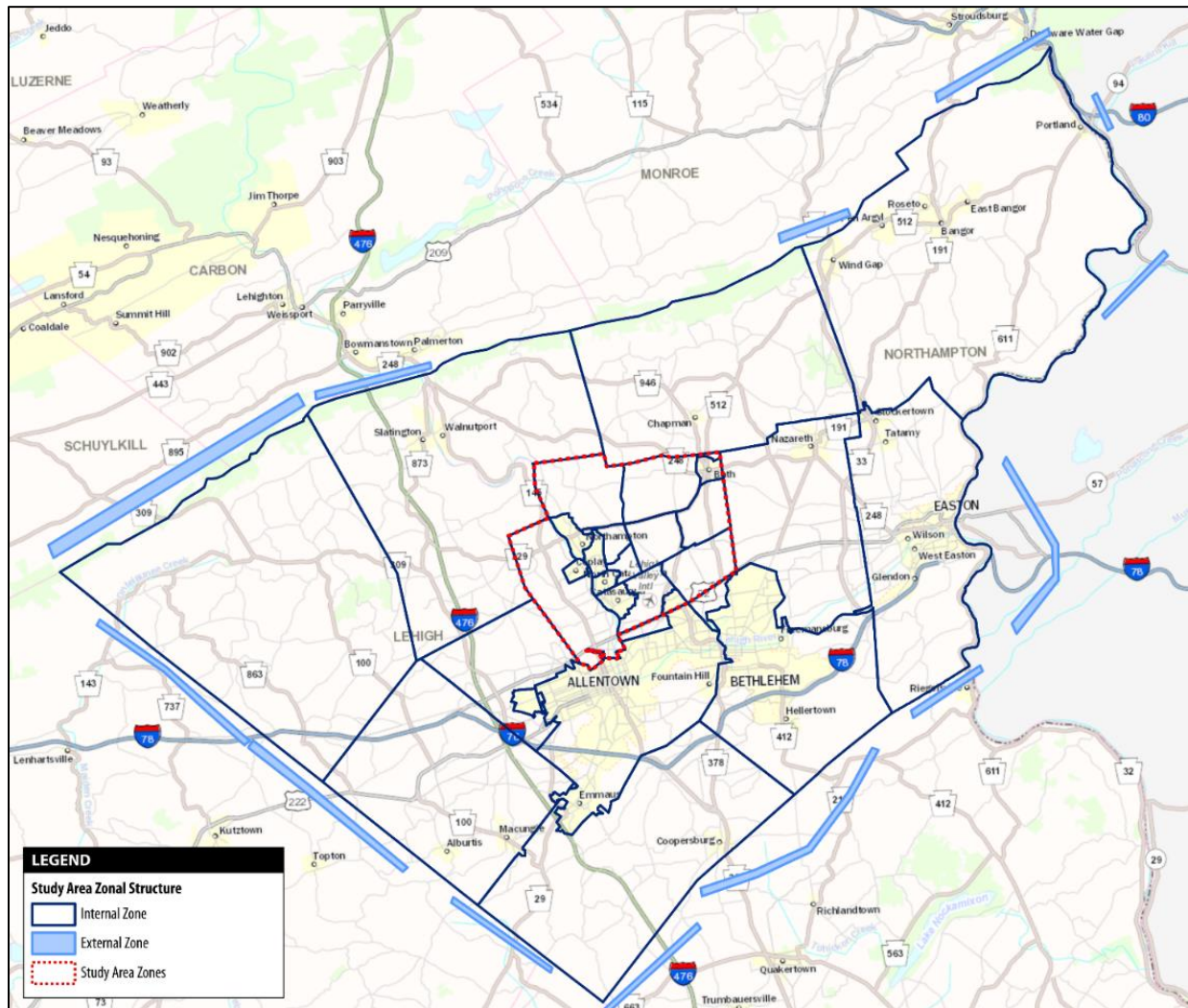
Additionally, a total of \$40 million in private funding has either been contributed or bound to be committed to study area roadway improvements, including for the widening of Race Street and Airport Road, as well as roadways affected by the developments proposed by Liberty Trust, Jaindle-Watson, and Grace Enterprises.

### StreetLight Data Origin-Destination Analysis

Advancements in data collection technology and “big data” analytics are rapidly transforming how agencies plan for and manage an evolving transportation system. StreetLight Data has developed a streamlined, user-friendly approach for processing the hundreds of millions of location records created by mobile devices.

One key product available from StreetLight Data is origin-destination matrices that help visualize how both personal and commercial trips are occurring within a defined area. For this study, a zonal structure comprising 42 unique zones was created to analyze travel movements (the small zone sizes allow a more granular assessment of travel patterns). The LVIA study area includes 18 of the 42 zones. The StreetLight Data zonal structure can be organized into “internal” zones (zones indicating travel within a defined region) and “external” zones (zones associated with pass-through travel outside of the region). The LVIA study area StreetLight Data zonal structure is depicted in **Figure 7**.

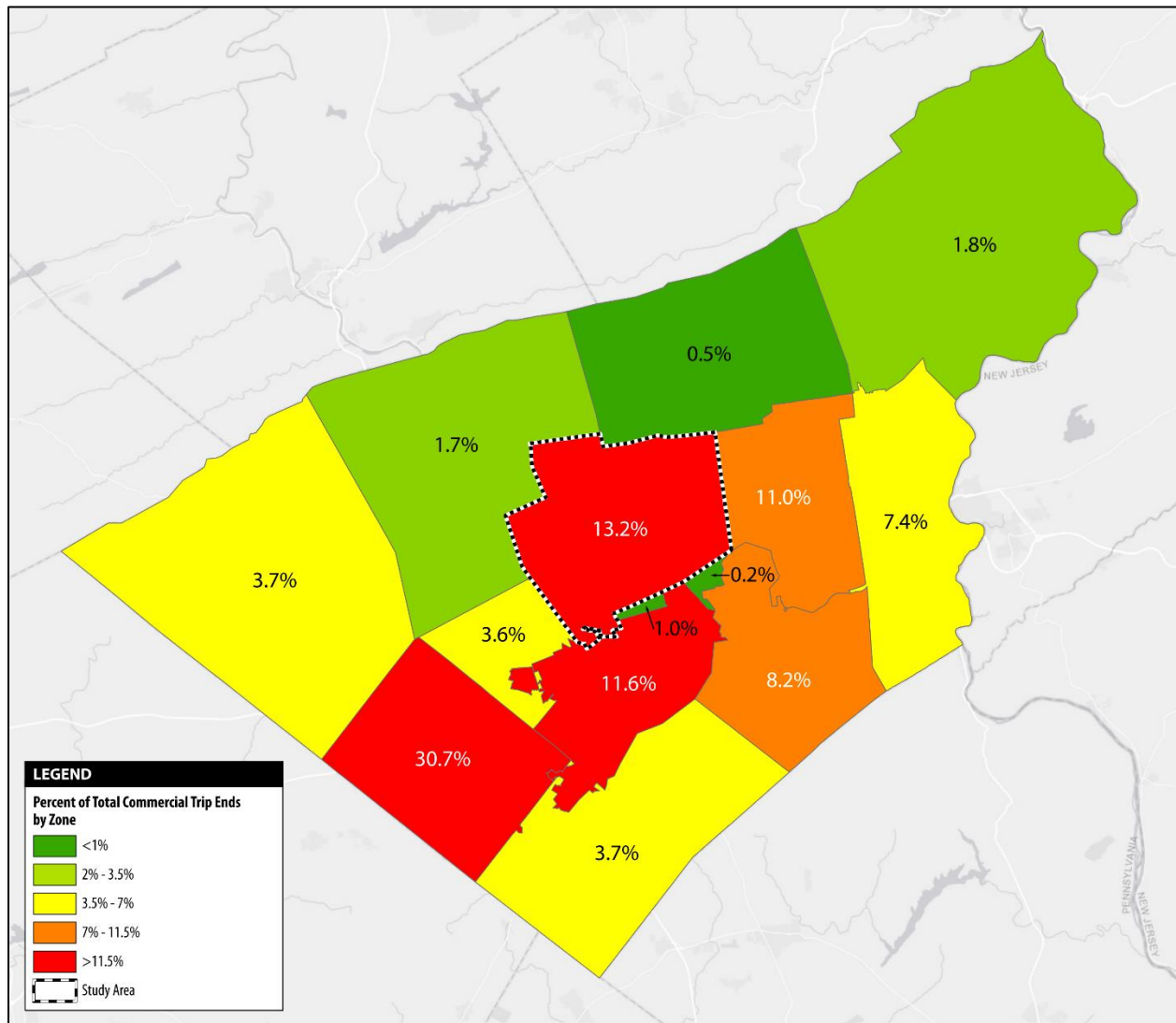
Figure 7: StreetLight Data Study Area Zonal Structure



Source: Streetlight Data 2017-2018

For every commercial trip completed, there are two trip ends: the origin and the destination. Total trip ends can be summed by zone to determine where the greatest number of truck traffic is beginning and ending. **From March 2017 to February 2018, there were 4,054,720 commercial trip ends in Lehigh and Northampton counties.** As shown in **Figure 8**, the southwestern portion of the region currently experiences the greatest intensity of commercial trip activity, with more than 42 percent of trips ending in one of two zones. The 18 study area zones were merged into one larger zone to determine total trip ends. The combined zone accounts for 535,305 (or 13.2 percent) of commercial vehicle trip ends region-wide.

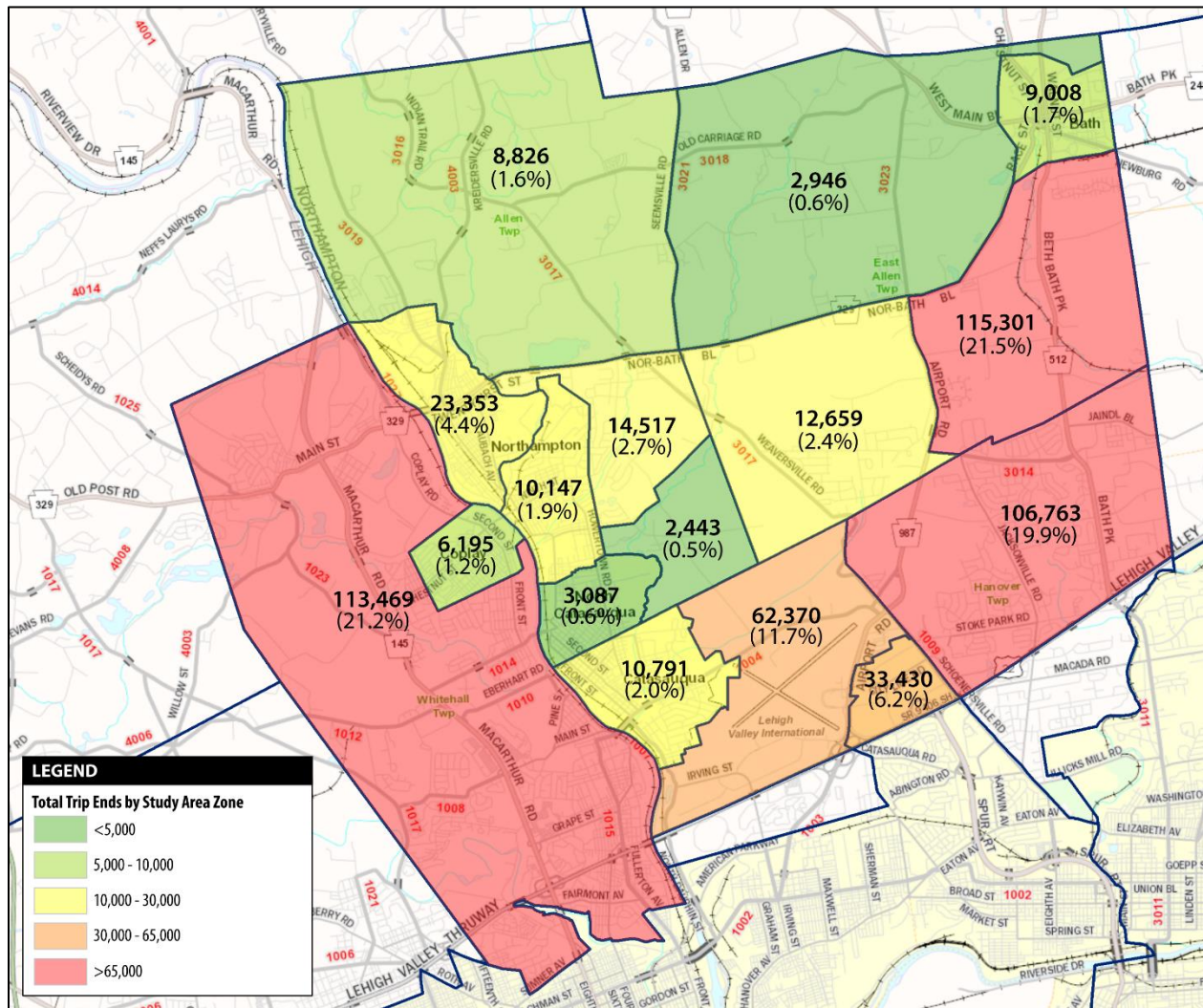
Figure 8: Total Commercial Trip Ends by Zone (Average Day)



Source: Streetlight Data 2017-2018

A review of total trip ends by study area zone indicates greater commercial activity west of the Lehigh River along PA 145 (MacArthur Road) and east along PA 512 (Beth Bath Pike). Shown in **Figure 9**, three zones currently account for more than 62 percent of all truck trip ends occurring within the study area.

Figure 9: Total Commercial Trip Ends by Study Area Zone (Average Day)

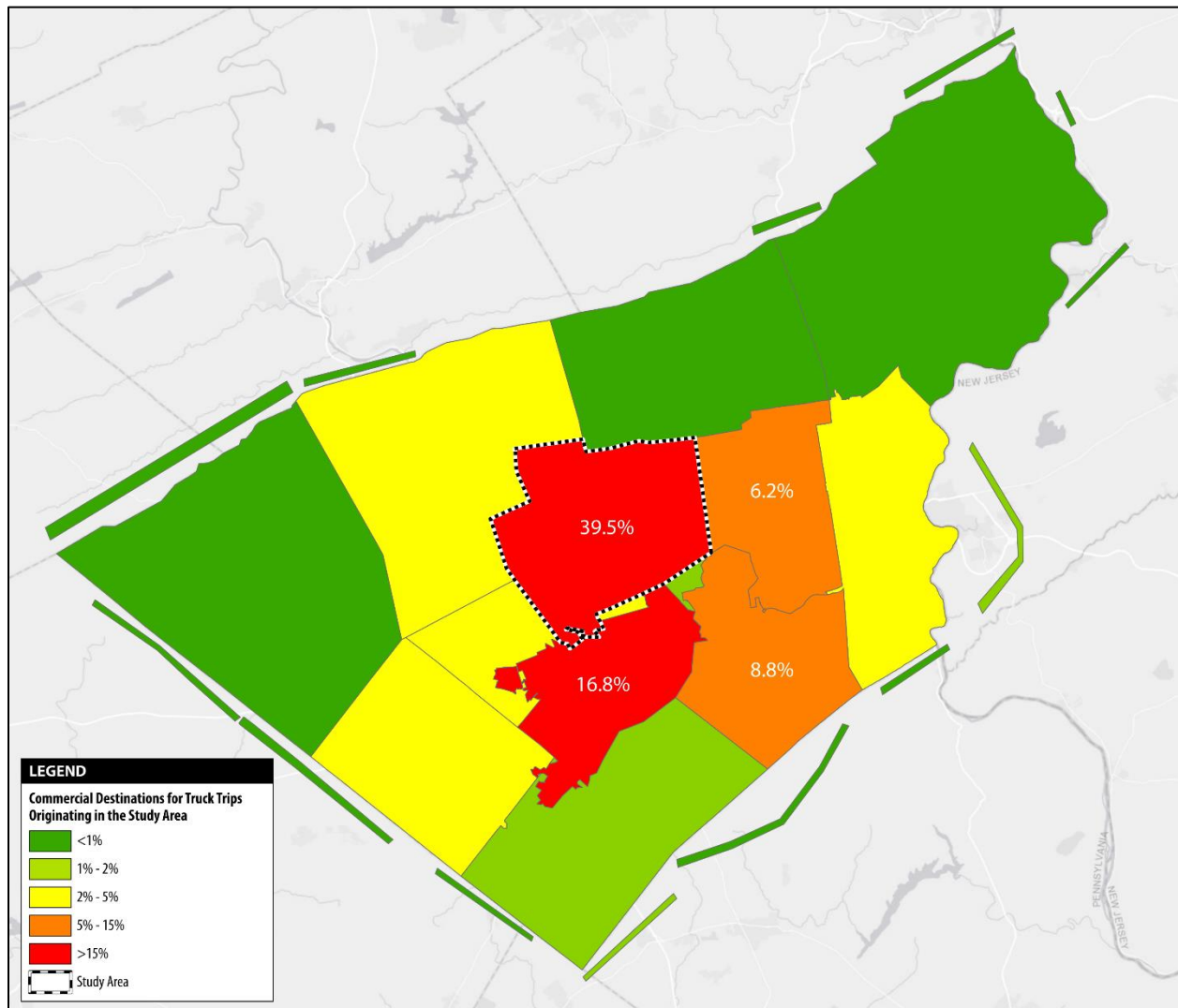


Source: StreetLight Data 2017-2018

## Lehigh Valley International Airport Area Freight Study

Trips originating in the study area can be linked to a destination zone to determine where commercial vehicles are traveling. **Figure 10** depicts the commercial destinations by zone for truck trips originating in the study area on an average day. Nearly 40 percent of all truck trips begin and end in the study area and approximately 17 percent of trips that begin in the study area travel south and to destinations in Allentown. Fewer than 7 percent of truck trips currently originating in the study area leave the LVPC region.

**Figure 10: Commercial Destinations for Truck Trips Originating in Study Area (Average Day)**

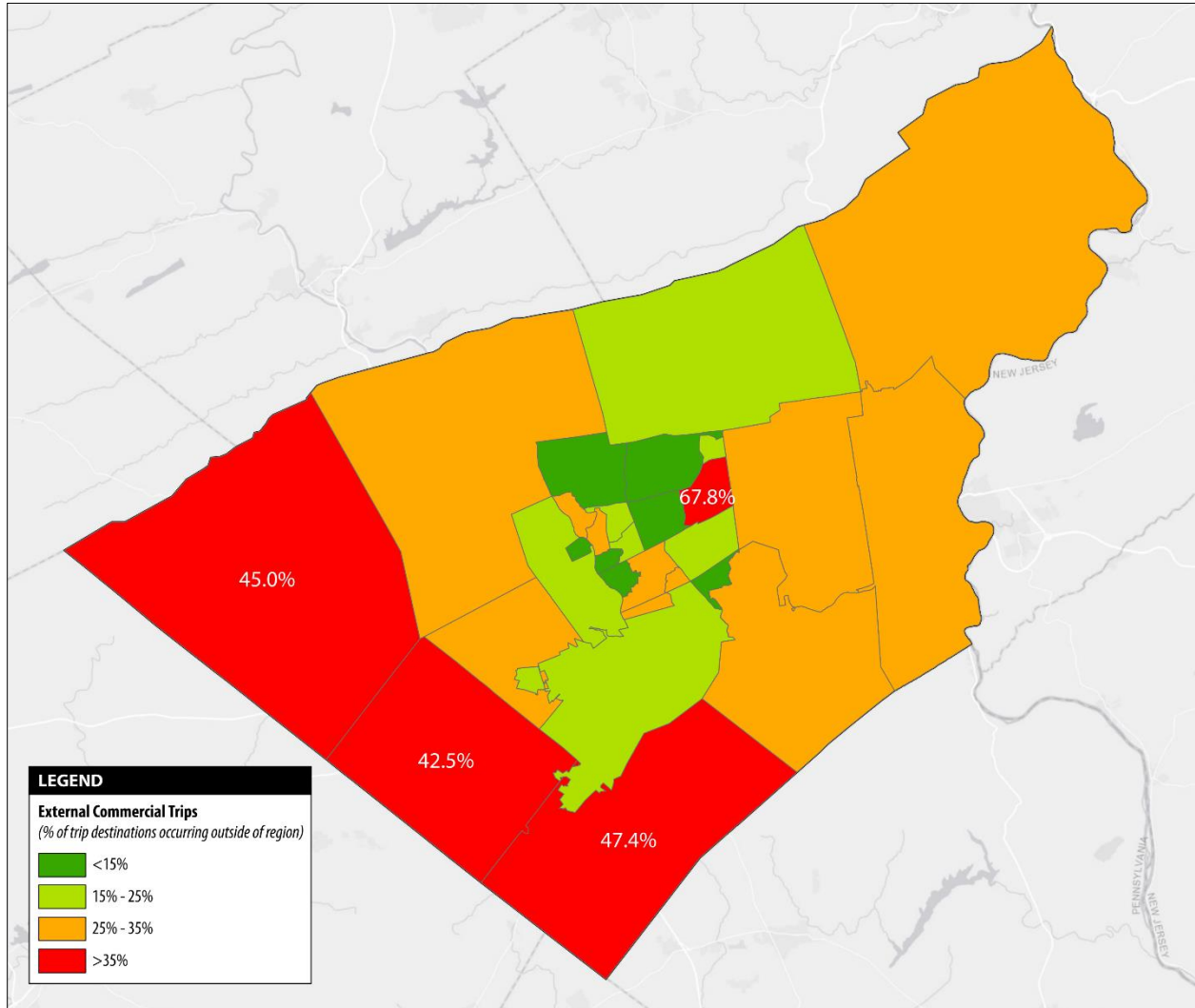


Source: StreetLight Data 2017-2018

Detailed trip interchange maps for the 18 study area zones is provided in **Appendix B: StreetLight Data Commercial Interchanges by Study Area Zone**.

StreetLight Data can also determine, by zone, the percentage of trips leaving the region. Shown in **Figure 11**, a higher percentage of trips originating in the western zones begin in the region but reach their destination outside of the region.

**Figure 11: Commercial Trips Leaving the Region**



Source: StreetLight Data 2017-2018

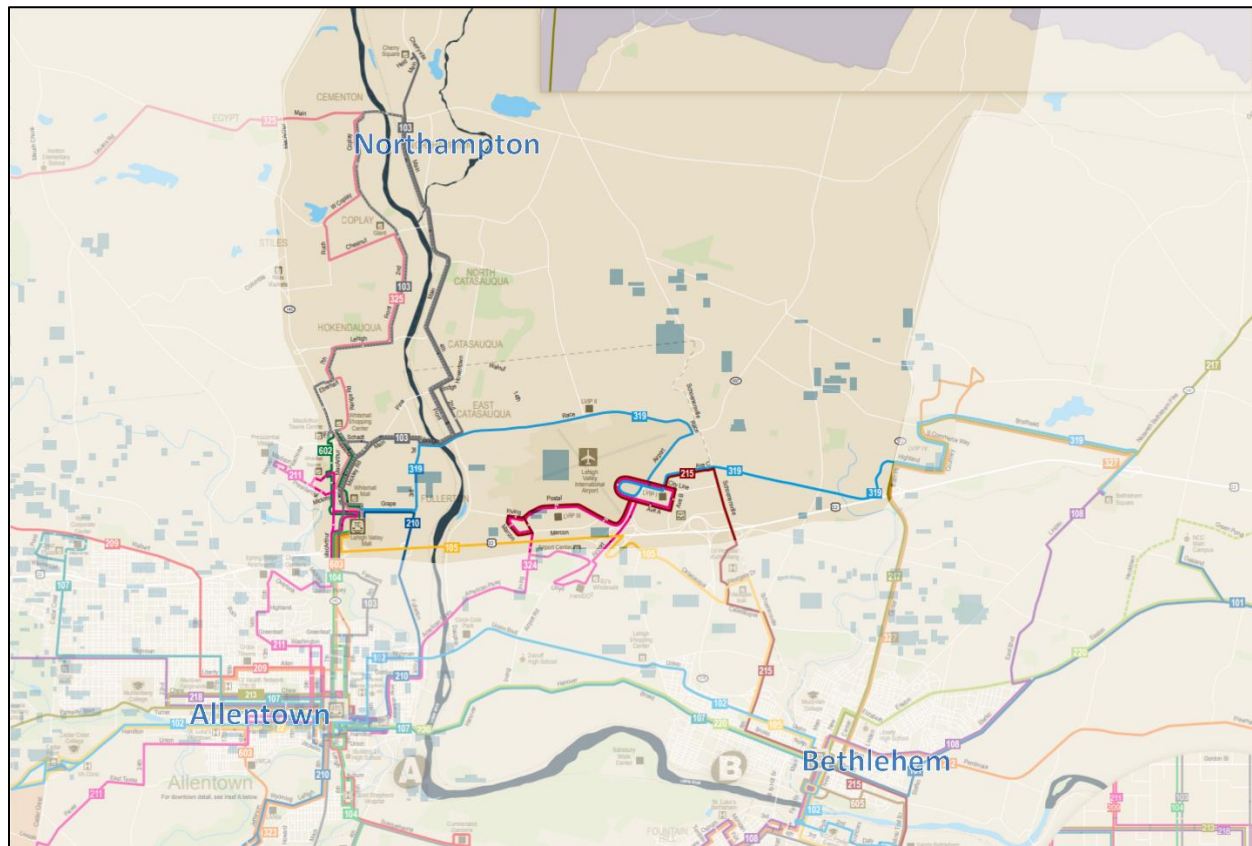
### Public Transportation

Public transportation in the Lehigh Valley is primarily operated by the Lehigh and Northampton Transportation Authority (LANTA). LANTA provides both fixed-route bus and shared-ride services in Lehigh and Northampton counties.

There are currently 28 bus routes in the LANTA fixed-route system and 10 of those routes serve the study area (**Figure 12**). The study area is located north of LANTA's central service area, however land use quickly becomes more rural north of LVIA and east of the Lehigh River. As a result, only the southern and western portions of the study area are served by fixed-route transit. Three fixed routes converge at LVIA, an important transportation connection point. Nine routes converge at the Lehigh Valley Mall, the second-largest transfer point in the LANTA service area.

Fixed routes within the study area are found in **Appendix C: LANTA Fixed Routes**.

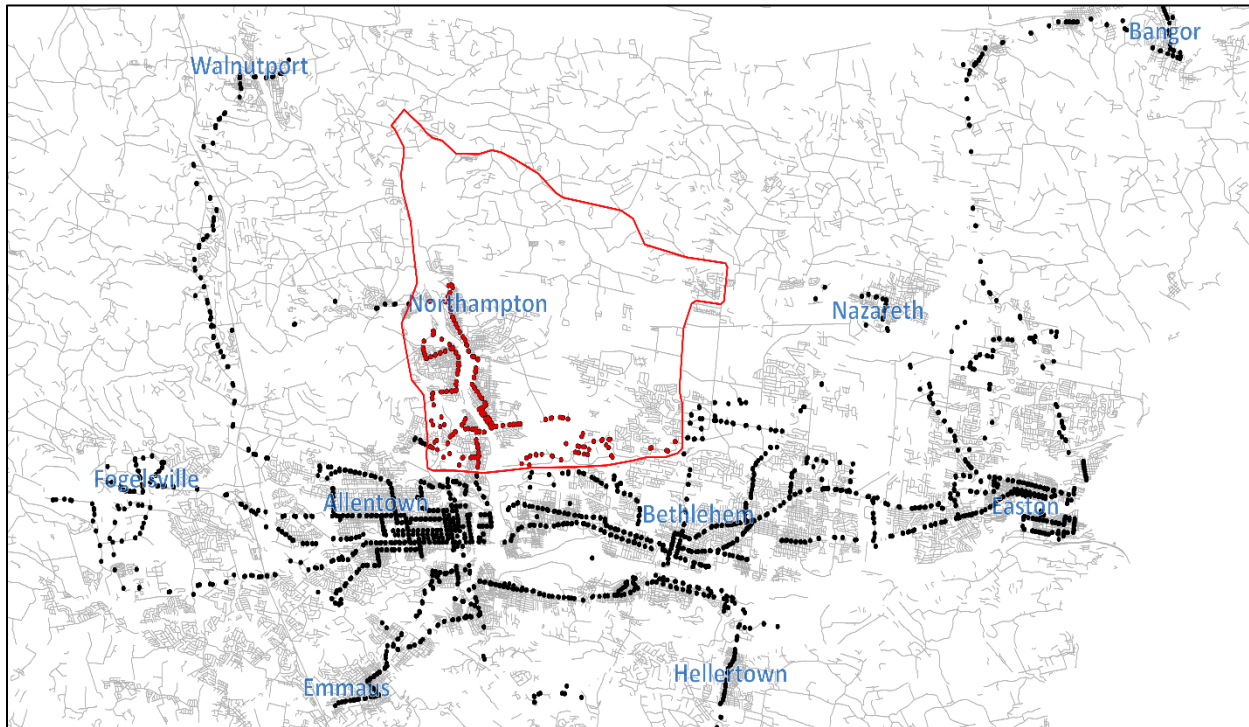
**Figure 12: LANTA Fixed-Route Bus Service within Study Area**



Source: Lehigh and Northampton Transportation Authority and Remix (2017)

LANTA serves 2,174 bus stops. The study area contains 254 stops, or nearly 12 percent of all stops, shown in **Figure 13**. The highest-ridership stop within the study area is in Whitehall Township at Lehigh Valley Mall with 806 average daily riders, making it the second-busiest stop in the LANTA system. All remaining bus stops within the study area have average daily ridership less than 50.

Figure 13: LANTA Bus Stops with Study Area in Red



Source: Lehigh and Northampton Transportation Authority, Department of Planning (May 2017)

Approximately 187,000 riders board and alight buses within the study area each year, accounting for nearly 23 percent of LANTA's overall ridership. More than 80,500 bus trips pass through the study area annually. Annual ridership by route number and day of week are provided in **Appendix C**.



## Demographic and Socioeconomics

The municipalities within the study area have an estimated combined population of 173,329. Subtracting the City of Bethlehem (only a small portion of which is within the study area), the figure is closer to 98,036. Of greater importance to this study is the change in population for the Lehigh Valley region, which continues to exhibit strong growth rates. Growth within the region in fact is outpacing that of Pennsylvania overall. The City of Allentown overtook Erie during the 1990s to become the state's third-most-populous city. The Lehigh Valley is not only a major shipper and receiver of freight, but a major consumer market in its own right. Growth in total population increases demand for goods and services, and the warehouses and infrastructure that are needed to support them.

Within the study area, growth *rates* have been the strongest within Allen Township, which has added an estimated 600 residents since 2010. Larger study-area municipalities, such as Hanover Township (Northampton County) and Lower Nazareth Township, have also grown by hundreds since 2010. The boroughs have registered slight declines over the same period. **Table 3** provides more detail on changes in study-area population by municipality. The study area is growing at the same rate as the region as a whole.<sup>8</sup>

**Table 3: Study Area Total Population Trends**

Municipality	1990	2000	2010	2016 (est.)	2010-16 Change (%)
Allen Twp	2,626	2,630	4,269	4,860	13.8%
Bath Borough	2,358	2,678	2,693	2,672	(0.8%)
Bethlehem City	71,427	71,329	74,982	75,293	0.4%
Catasauqua Boro	6,662	6,588	6,436	6,544	1.7%
East Allen Twp	4,572	4,903	4,903	4,868	(0.7%)
Hanover Twp – L	2,033	1,913	1,571	1,588	1.1%
Hanover Twp – N	7,176	9,563	10,866	11,575	6.5%
Lehigh Twp	9,296	9,728	10,526	10,419	(1.0%)
Lower Nazareth Twp	4,483	5,259	5,674	6,111	7.7%
Moore Twp	8,418	8,673	9,198	9,282	0.9%
North Catasauqua Boro	2,867	2,864	2,849	2,831	(0.6%)
Northampton Boro	8,717	9,405	9,926	9,863	(0.6%)
Whitehall Twp	22,779	24,896	26,738	27,423	2.6%
TOTAL STUDY AREA	153,414	160,429	170,631	173,329	1.6%
Lehigh Valley Region	538,235	579,156	647,232	665,441	2.8%

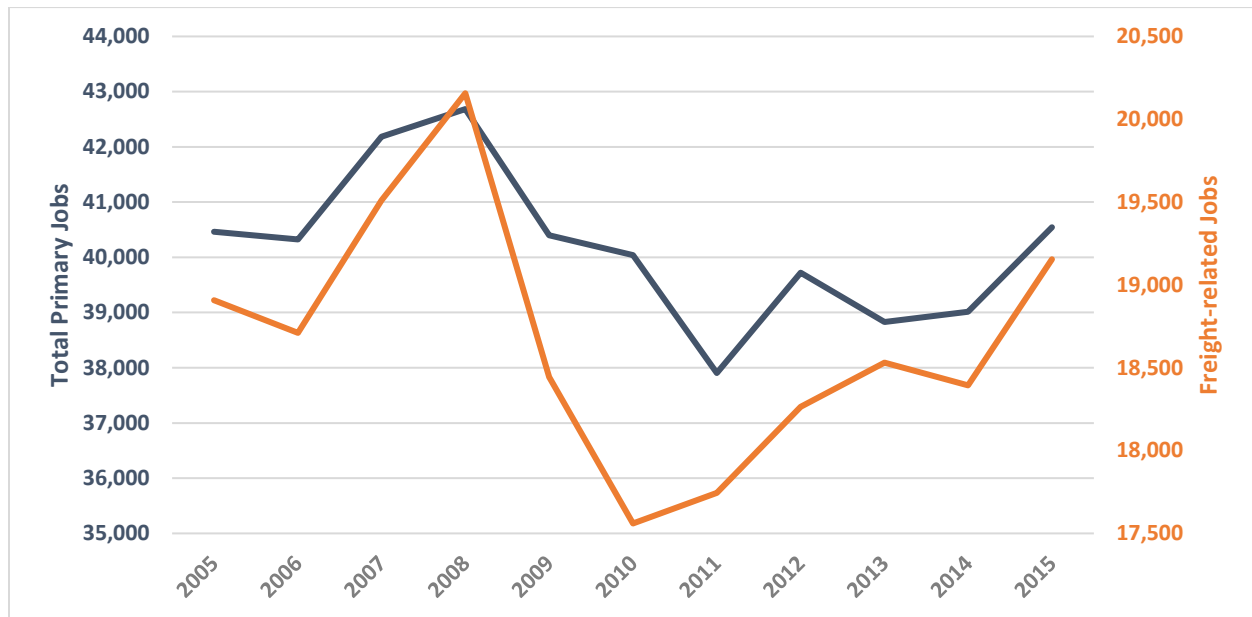
Source: U.S. Census

While population estimates for municipalities within the study area indicate steady growth, employment numbers have been fluctuating since 2005. According to the most recent 2015 estimates from the Longitudinal Employer-Household Dynamics (LEHD) program, the study area contains 40,544 primary jobs. Primary jobs are defined by the LEHD program as all public- and private-sector jobs, one job per

<sup>8</sup> Not including the City of Bethlehem, which represents a very small share of the study area

worker. This employment total increased by roughly 0.2 percent since 2005, with a more significant increase occurring between 2014 and 2015 (3.8 percent), shown in **Figure 14**.<sup>9</sup>

**Figure 14: Primary and Freight-related Employment within the Study Area (2005-2015)**



A review of freight-related employment within the study area indicates a similar trend, with a more significant decrease in employment coinciding with the Great Recession, which began in December 2007 and ended in June 2009.

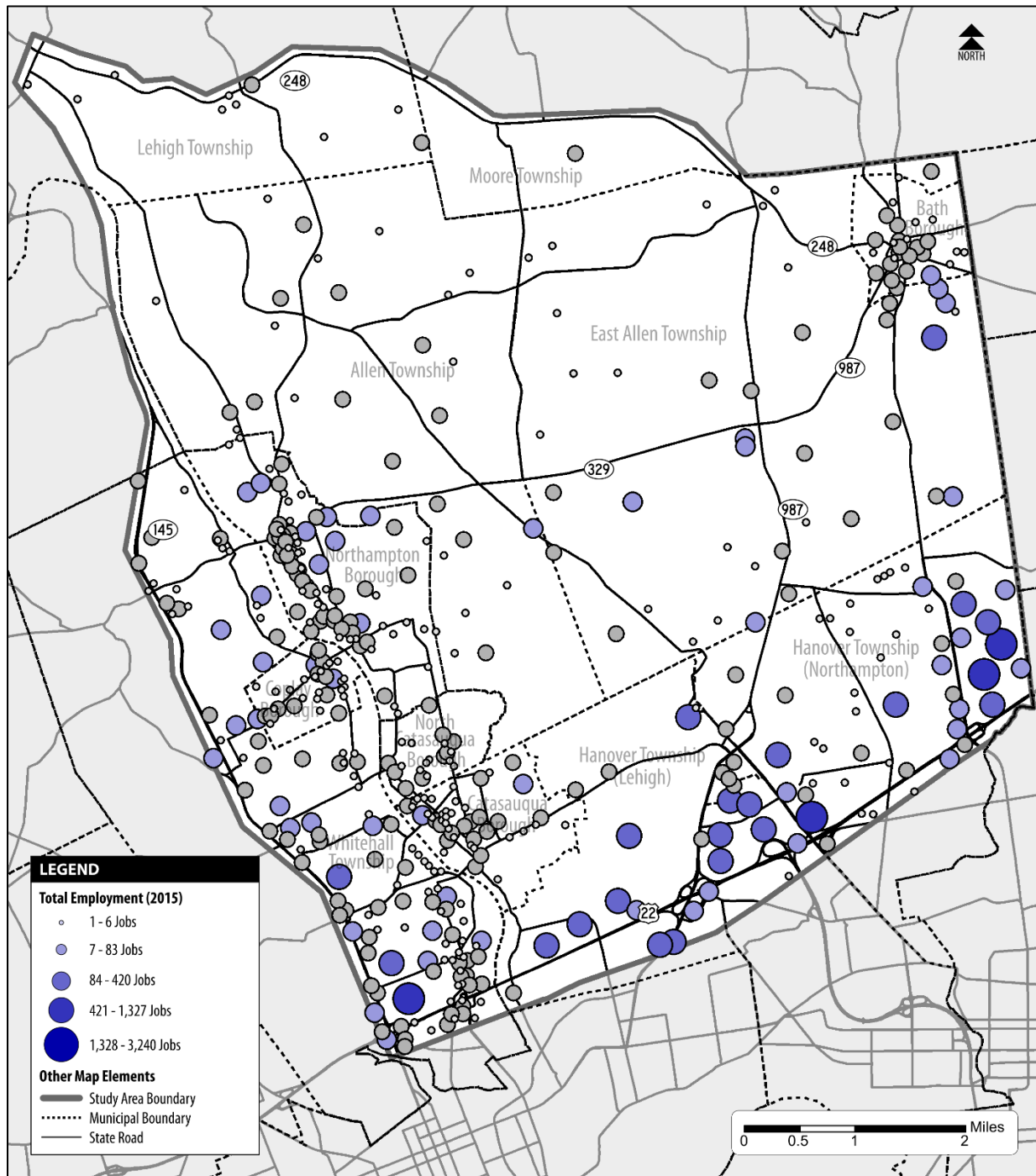
For this review, freight-related employment includes jobs in the following industry sectors:

- Mining, Quarrying, and Oil and Gas Extraction
- Construction and Manufacturing
- Wholesale and Retail Trade
- Transportation and Warehousing

The highest concentrations of total employment occur along US 22 to the south and along the Lehigh River to the west (shown in **Figure 15**).

<sup>9</sup> At the time this report was being written, the latest LEHD data available was 2015.

Figure 15: Total Employment (2015)

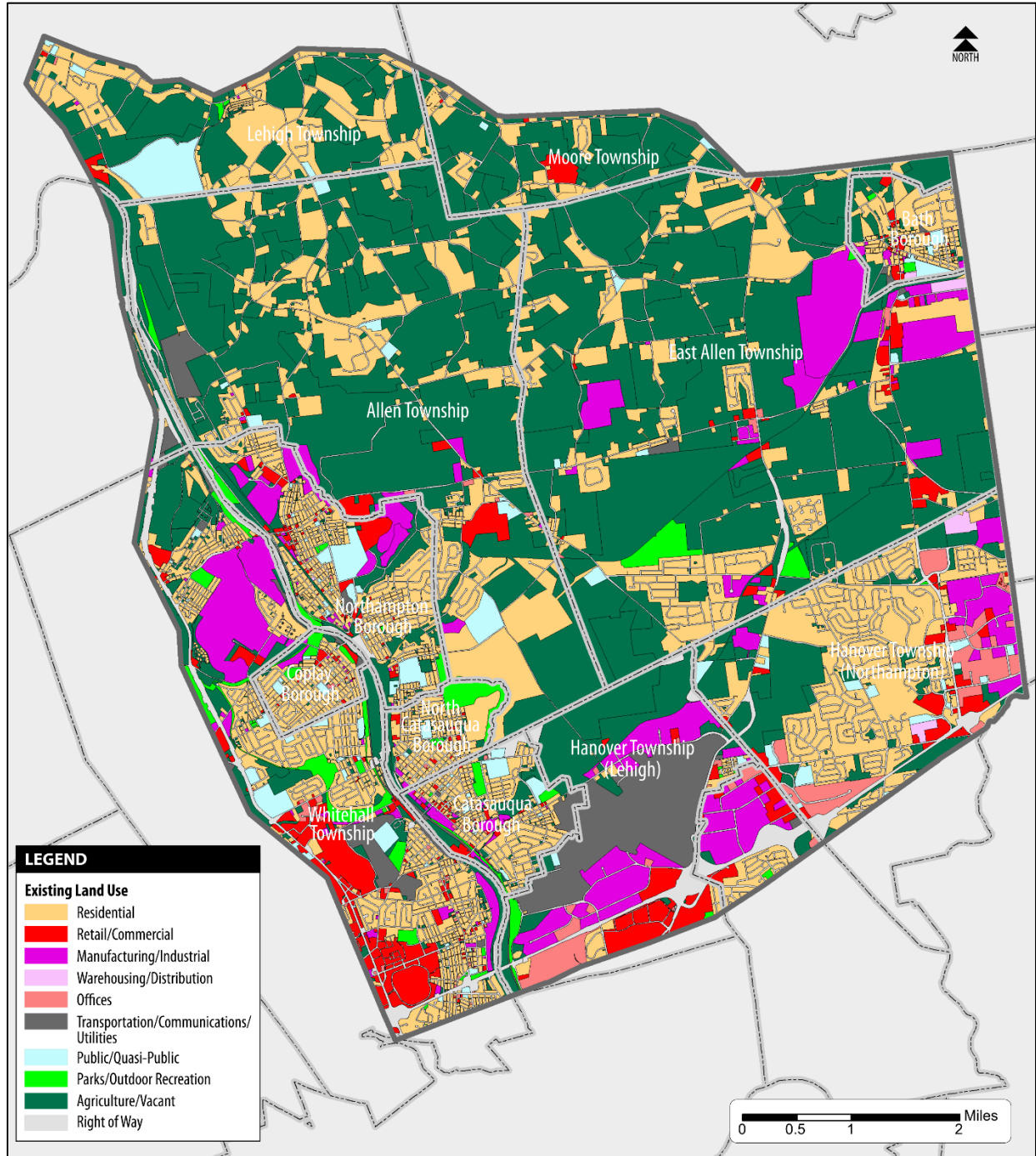


Source: U.S Census/Longitudinal Employer-Household Dynamics (LEHD)

## Existing Land Use

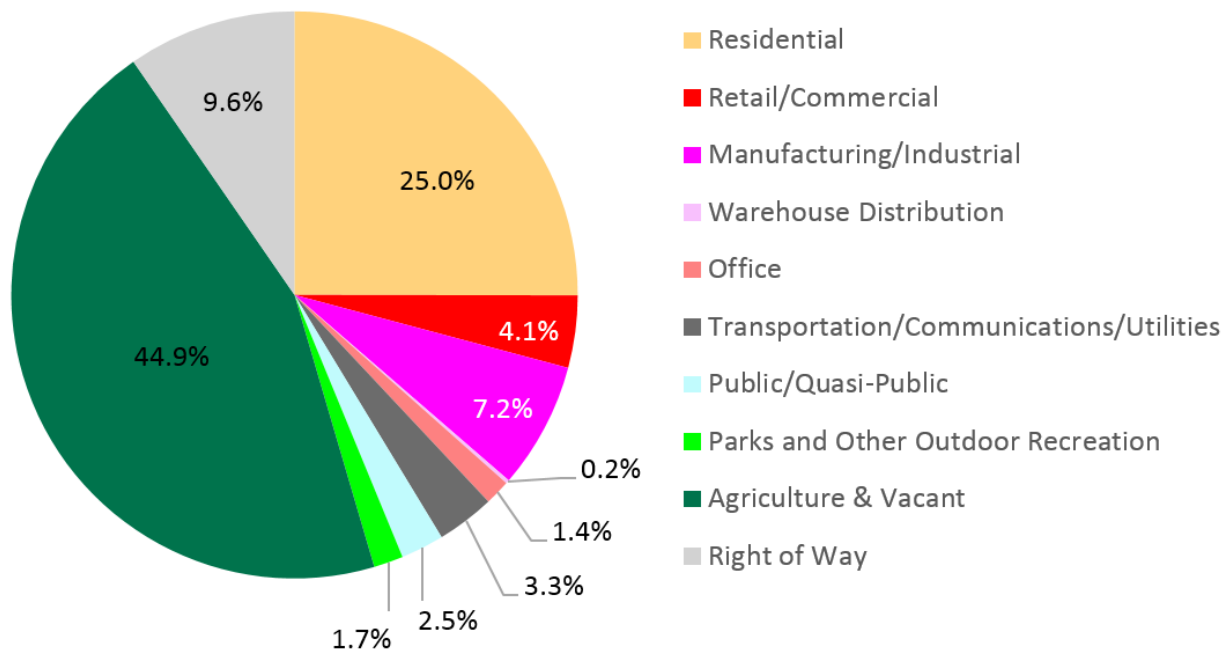
Shown in **Figure 16** and **Figure 17**, the study area's existing land use is characterized by an abundance of agricultural and open space uses in the northern portion and denser, mixed uses in the southern portion. The availability of large, undeveloped tracts of land within the study area has led to an increase in the number of warehouse and distribution centers (under development).

**Figure 16: Study-Area Existing Land Use**



Source: LVPC

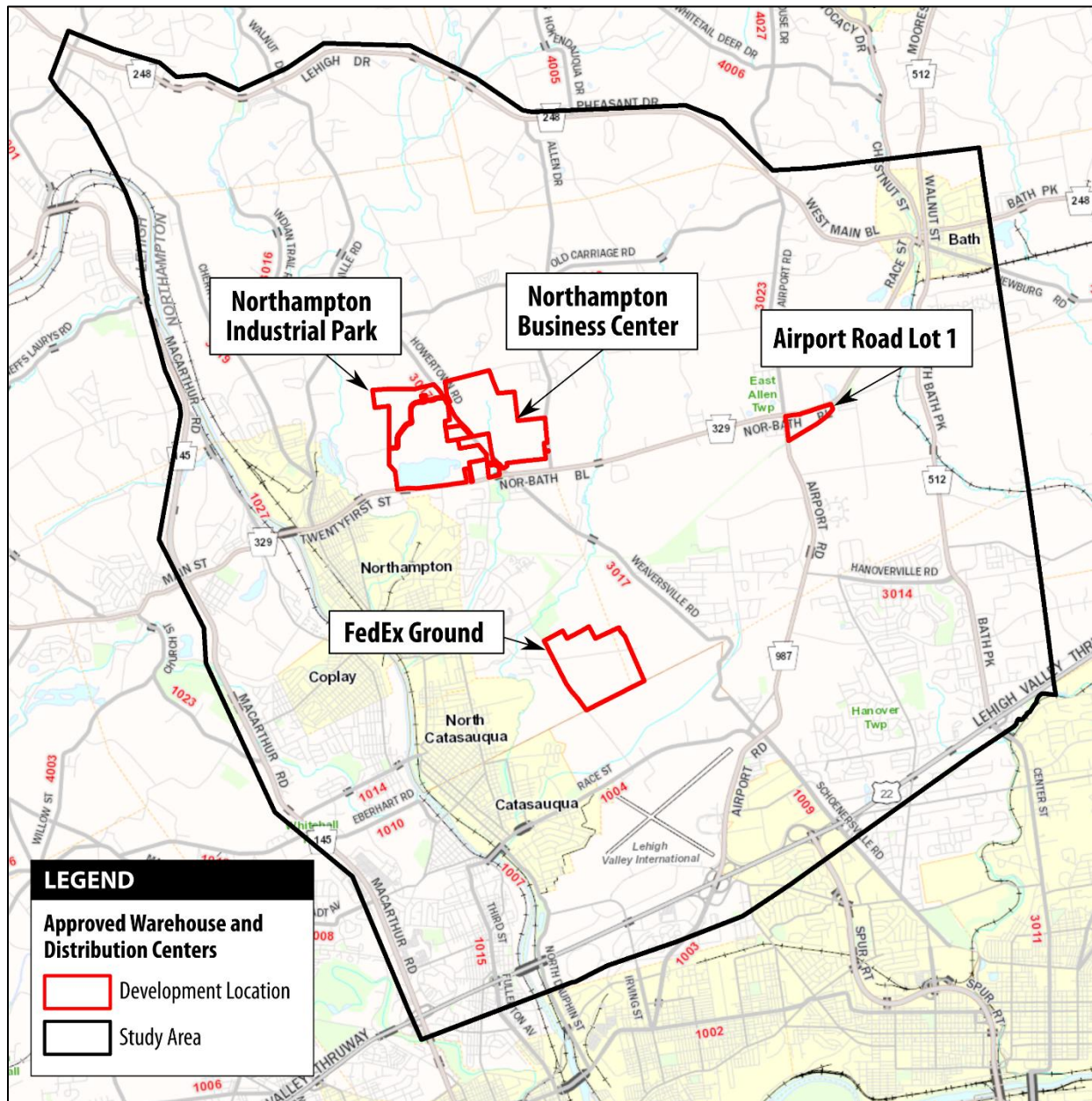
Figure 17: Study-Area Existing Land Use Composition



Highlights of the study area's existing land use include:

- During 2016, Lehigh County municipalities approved 7.3 million square feet (MSF) of non-residential development, a nearly four-fold increase from the previous year.
- In neighboring Northampton County, an additional 3.5 MSF were approved.
- One of the top non-residential projects the LVPC reviewed during 2016 was the 1.16 MSF FedEx Ground facility in Allen Township, adding to the study area's already abundant inventory of shippers and receivers.
- Less than 1 percent of the study area's land area is classified as "warehouse distribution," according to LVPC's existing land use database. Despite its small share of the study area, this land use has a disproportionate impact on the area's travel patterns.
- In addition to FedEx Ground, three other large-scale warehousing and distribution center developments have been approved in the study area, as depicted in **Figure 18**.

Figure 18: Approved Warehouse/Distribution Centers within the Study Area



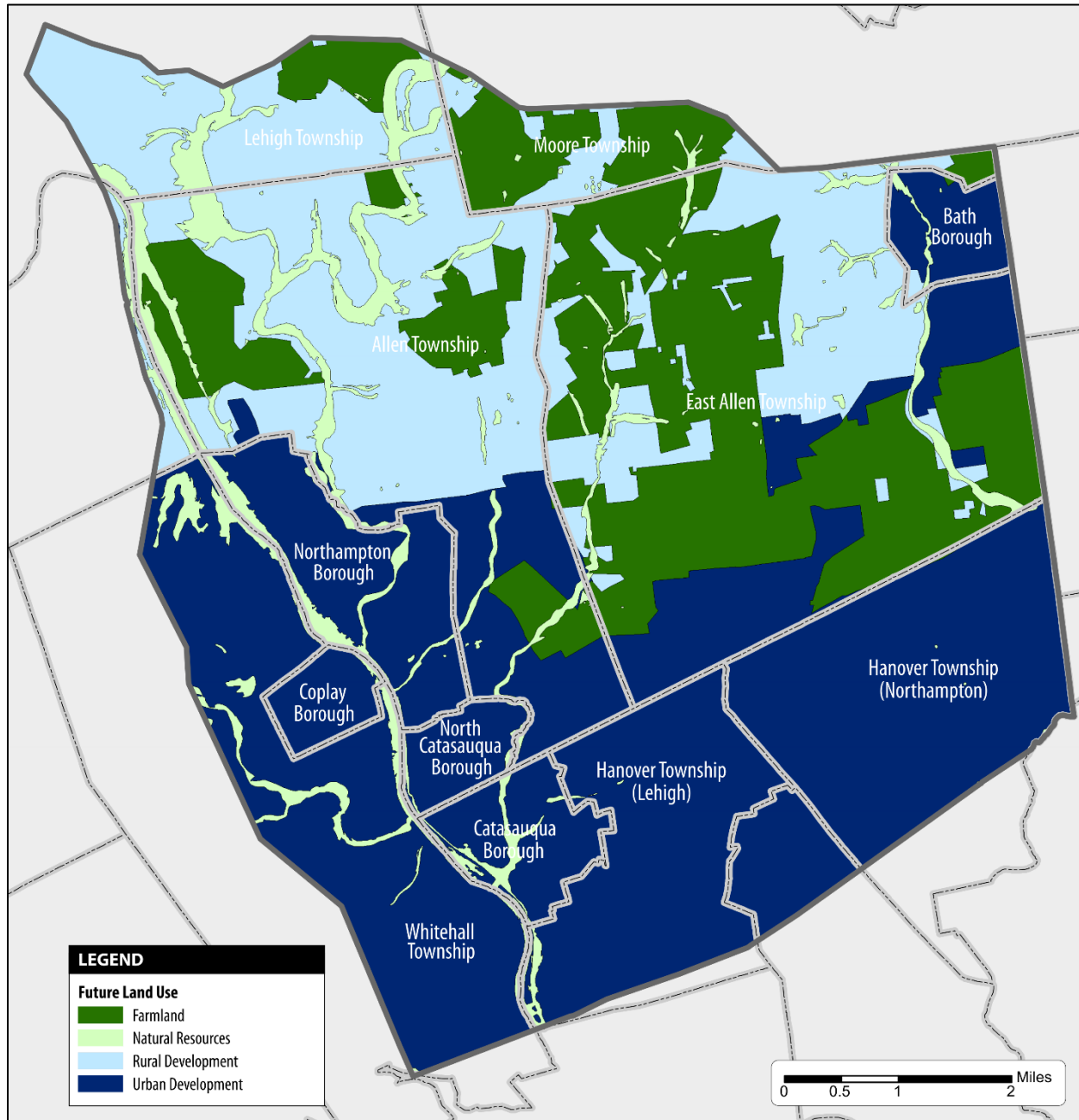
Source: LVPC

The LVPC Comprehensive Plan, last updated in 2010, includes guidance on preferred future land use within the region. The general future land use categories and their associated objectives include:

- **Farmland** – to protect farmland and to promote farming as an economic activity
- **Natural Resources** – to protect sensitive natural resources, particularly flood plains and steep slopes, from inappropriate development
- **Rural Development** – to provide development opportunities consistent with the context of rural land use patterns and capabilities
- **Urban Development** – to provide areas where development can occur, coordinated with the provision of infrastructure and to meet the needs for development sites

Shown in **Error! Not a valid bookmark self-reference.**, the study area is characterized by urban development future land uses to the south and west, along major transportation corridors and within denser, predominately built-out municipalities. The recommended future land use in the northern portion of the study area is predominately farmland, rural development, and natural resources, with the exception of Bath Borough.

Figure 19: Study Area Future Land Use



Source: LVPC

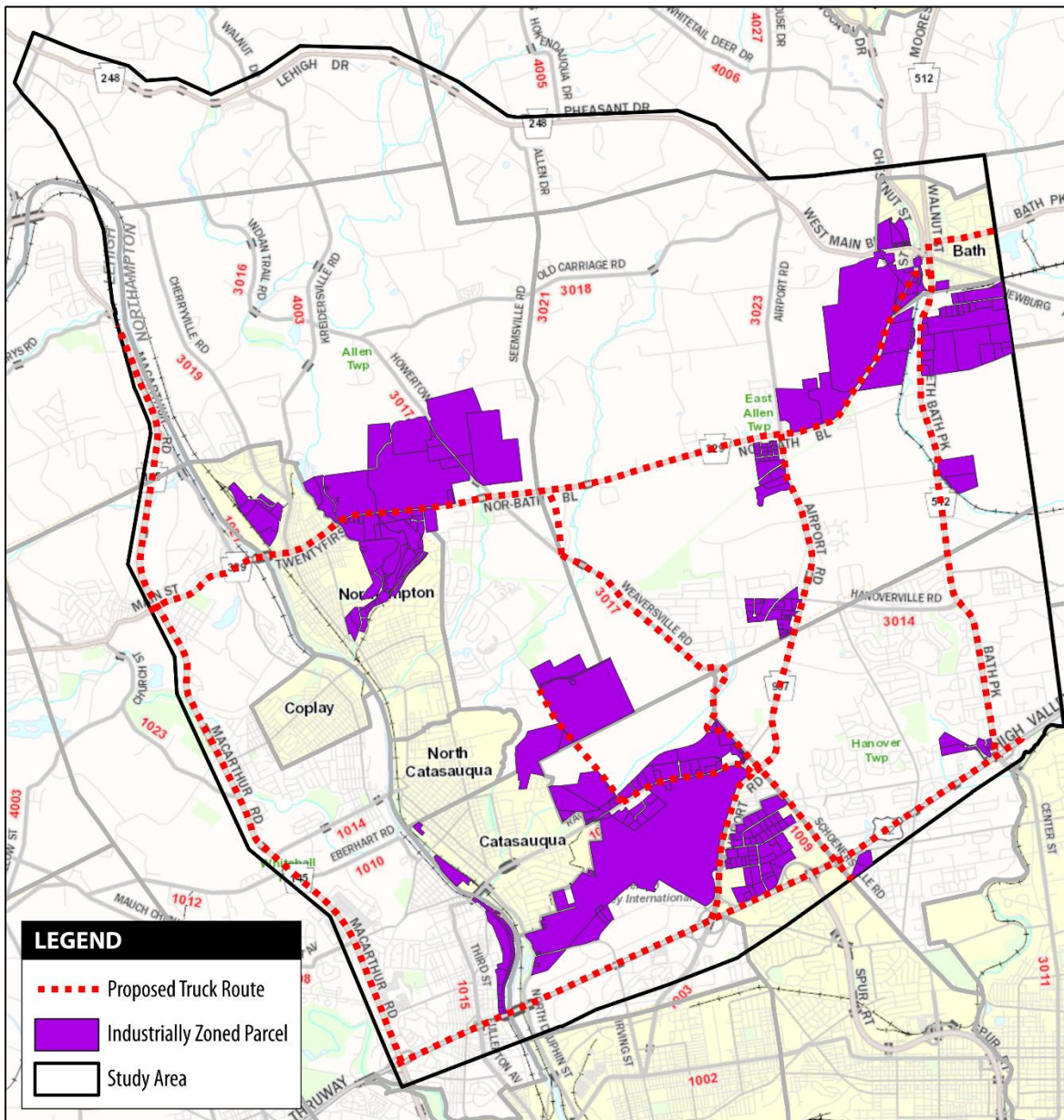
### Zoning Analysis

The study area consists of 13 municipalities containing nine proposed truck corridor routes, as mapped in **Figure 20**. Recommended truck corridors within the study area are as follows:

- US 22
- PA 329 (Nor-Bath Blvd)
- East Race Street
- SR 3017 (Weaversville Road)
- PA 512 (Beth Bath Pike)
- PA 248 (E. Northampton Street)
- PA 987 (Airport Road)
- Willow Brook Road
- PA 145 (MacArthur Road)

An analysis of zoning provisions within each study area municipality was conducted to identify inconsistencies between current zoning requirements and recommended truck corridor routes. Land use inconsistencies are defined as those zoning districts that allow (either by right or by special exception or by conditional use process) trucking-related uses on vacant or underutilized parcels along roadways other than those designated as truck corridor routes. Vacant and/or underutilized lands that have been determined to be inconsistent with the designated truck corridor routes are located within the municipalities of Lehigh Township, Hanover Township, Catasauqua Borough, and Bath Borough.

Figure 20: Current Industrially-Zoned Properties and Recommended Truck Corridors



**Appendix D: Study-Area Truck-Generating Parcels against Proposed Truck Network** summarizes each municipality's current zoning, existing land uses, and zoning inconsistencies against this proposed truck network.

### Stakeholder Engagement

The LVIA Area Freight Study process included community outreach that directly engaged key stakeholders and members of the public to gather meaningful input on freight development trends and issues within the study area.

Stakeholder roundtables offered an opportunity to provide detailed feedback on proposed high impact developments and identify specific transportation improvements that are needed to address the ongoing growth in the study area.

### Stakeholder Roundtables

On June 18 and 19, 2018, LVPC hosted a municipal representative roundtable and an economic development stakeholder roundtable to collect input on the most pertinent issues related to freight movement in the study area. Approximately 20 individuals participated as part of the stakeholder roundtable series. Input received ranged from general observations about freight activity and its impacts on the regional transportation system to detailed specifications on approved land development plans. Key themes that emerged during the stakeholder roundtables included:

- **Truck parking and related impacts** – There has been a dramatic increase in truck traffic within the study area and it is resulting in truck parking issues. There have been instances of trucks parking in the center of roadways and along the shoulder near the new distribution centers. Because there are no truck stops in the study area, there are few options for drivers who are restricted by hour-of-service regulations.
- **102"-wide vehicles** – Act 31 went into effect in June 2018. Prior to the new law, 102" vehicles were limited to the "truck access network," which consists of interstates, numbered traffic routes (e.g., PA 987, PA 512, PA 248, etc.), and four-digit state routes that were added on a case-by-case basis. Act 31 removes this limitation for any legally registered standard vehicle unless a traffic study is completed to justify prohibition of certain types of trucks. This new law will have impacts on the roadways within the study area, where new warehouse and distribution centers have been approved for construction.
- **Congestion** – Traffic congestion was a frequently noted concern among municipal and economic development stakeholders. Within the study area, there are residential and open space areas with older roads that were not built for high traffic volumes. The intermingling of freight with regular traffic creates poor travel conditions. Economic development stakeholders noted the detrimental impact severe congestion has on attracting businesses to the region.
- **Roadway geometry** – Certain roadways are currently not built to handle large, heavy trucks. Similarly, there are known geometry concerns within the study area (alignment, turning radii, width, lack of shoulders, sight distance, etc.) at major intersections, hampering traffic flow and safety.
- **Multi-municipal approaches** – There is a need for increased coordination and planning among municipalities within the study area. Higher-intensity developments have been approved in certain municipalities and those developments create negative impacts on adjacent areas.

Meeting summaries from the June 2018 stakeholder roundtables are included in **Appendix E: Stakeholder Roundtable Meeting Summaries**.

## Municipal Interviews

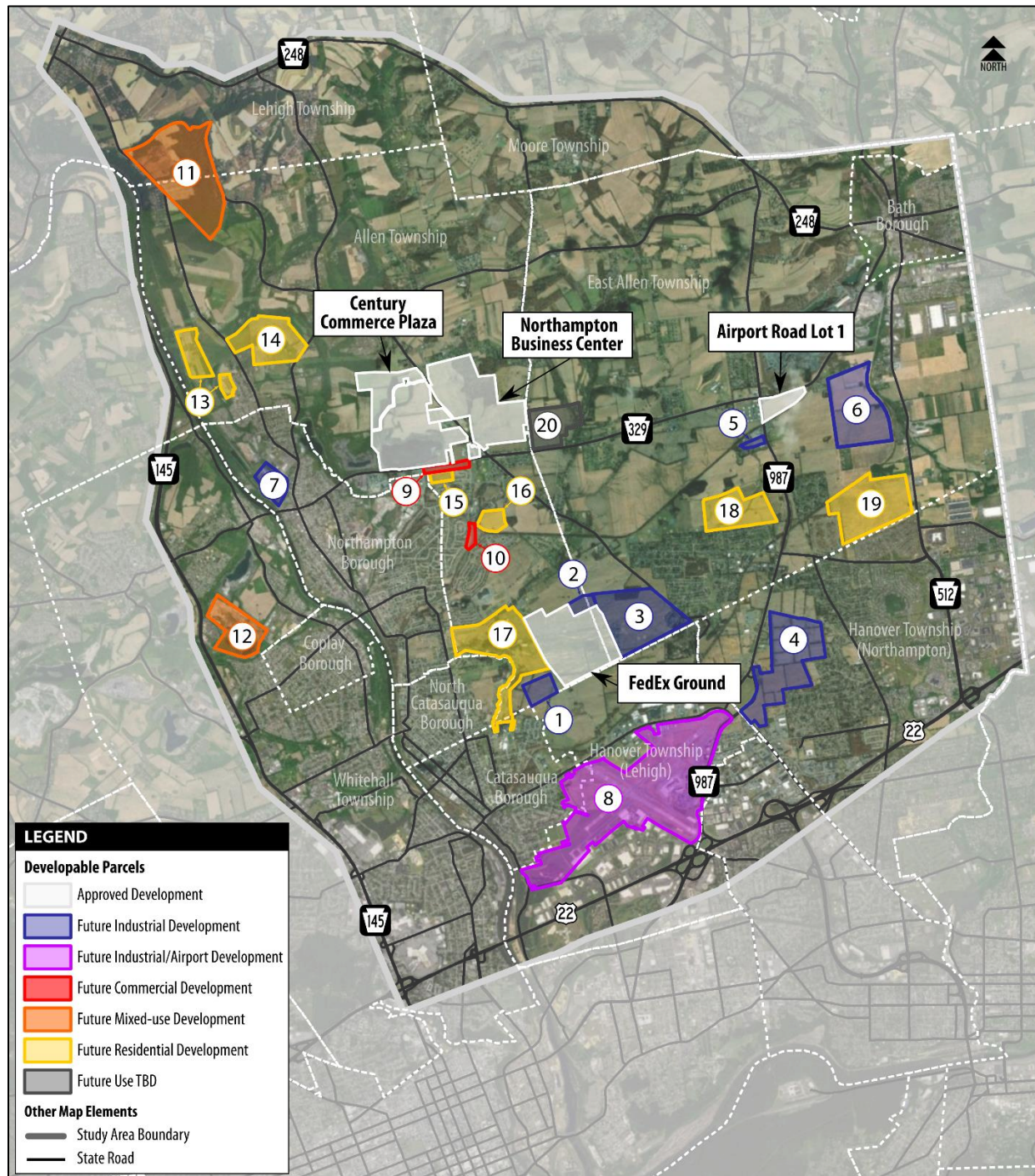
While the municipal roundtable provided local government representatives an opportunity to discuss broad themes and issues related to freight, follow-up interviews were needed to further assess the potential land use changes that may occur over the study horizon. One-on-one interviews were conducted with the following municipalities:

- Allen Township
- Bath Borough
- East Allen Township
- Hanover Township (Northampton County)
- Lehigh Township
- Moore Township

The municipal interviews were guided using a set of predefined questions that focused less on high-level regional issues and more on anticipated high-intensity local development. Specifically, the municipalities were asked to provide information on known development plans that were either approved or in a preliminary state. They were also instructed to disclose any recent zoning changes that would allow for an increase in development. Each potential development site was added to a master list of “Wild Card” parcels, or parcels that are expected to build out over the next 10 years. The “Wild Card” parcels were also mapped alongside the four approved warehouse and distribution center sites to provide a complete “full build-out” scenario, shown in **Figure 21**.

The “Wild Card” parcels were categorized by future land use type and are described in **Table 4**.

Figure 21: Future Development Sites within the Study Area



Source: LVPC and Municipal Interviews

Table 4: Future Development Details by Property

MapID	Development Description	Lot Acreage	Building SF / Dwelling Units	Municipality
Industrial Future Use	<b>1 Rockefeller Lot 5</b> – The site is assumed to redevelop for industrial uses and is currently accessible from Willowbrook Road. (PIN: M5 2 16E)	70	1 MSF	Allen Twp
	<b>2 Rockefeller Lot 4</b> – The site is assumed to redevelop for industrial uses. It is located adjacent to both the Lehigh Northampton Airport Authority (LNAA) Tract and the FedEx Distribution Center. The development is expected to include a Regional Distribution Hub and a warehouse. (PID: M5 2 16D)	22	290,000 SF	Allen Twp
	<b>3 LNAA Tract</b> – This property is currently a farm in an agricultural zone. It was the subject of a rezoning request for a light industrial use, which was denied. It is located adjacent to Weaversville Road. (PIDs: M5 2 16; M5 2 5; M5 2 4)	208	1.5 MSF	East Allen Twp
	<b>4 Aircraft Flight Path Property</b> – The lot is currently open space in an agricultural area, but it is assumed to redevelop for light industrial uses. The site is accessible by Airport Road and Schoenersville Road. (PID: M5 7 14)	350	3 MSF	Hanover Twp (N)
	<b>5 Property Zoned Light Industrial / Business Park</b> – The site is currently zoned Light Industrial / Business Park and is owned by the Jaendl Company. The existing Imperial Realty business park, Airport Road Commercial Park, is being considered for redevelopment as a warehouse. (PID: L5 12 1A)	8	98,800 SF	East Allen Twp
	<b>6 Property Rezoned</b> – This 198.6-acre site is zoned as Agricultural/Rural Residential. A recent rezoning request for Light Industrial/Business Park was withdrawn by the owner. (PIDs: L6 5 3A; L6 5 1; L6 5 2)	199	2.5 MSF	East Allen Twp
	<b>7 Federal White Corporation</b> – The site is currently zoned I-2 Industrial District and has the potential for active industrial use in the future. (PIDs: L4 8 4D 0522 and L4 8 4D-2 0522)	36		Northampton Boro

## Lehigh Valley International Airport Area Freight Study

MapID	Development Description	Lot Acreage	Building SF / Dwelling Units	Municipality
Industrial / Airport Future Use	8 <b>Airport Property</b> – This is one of the largest industrially-zoned parcels in the study area. LNAA’s Airport Master Plan includes the development of restaurants and a 125-room hotel. (PIN: 641819088171)	766	TBD	Hanover Twp (L) / Catasauqua Boro
Commercial Future Use	9 <b>Commercial Zone</b> – This site is located immediately south of the Northampton Industrial Park and is zoned Commercial. While the property does not have a specified development plan, it presents a development opportunity for commercial use. (PID: L4 12 1)	17	500,000 SF	Allen Twp
	10 <b>Approved Strip Mall</b> – The existing land use for this property is open space, however the Jaendl Company has proposed developing the site into a strip mall. The parcel has been rezoned to Light Industrial. (PID: L4 18 4)	9	288,000 SF	Allen Twp
Mixed Future Use	11 <b>Mary Immaculate Property</b> – This parcel is the former site of the Mary Immaculate Catholic seminary. The Jaendl Company has submitted plans to convert the 400-acre site into a mixed-use resort and residential community. (PIDs: K3 11 15; K3 11 15)	400	501 DU	Allen Twp / Lehigh Twp
	12 <b>Former Mineral Extraction Site</b> – The site was formerly a mineral extraction operation. However, there have been preliminary discussions on converting the property into a mixed-use development. (PINs: 549906586088; 548997529774)	109	100	Whitehall Twp
Residential Future Use	13 <b>Approved Single-Family Development 1</b> – Two parcels to the west of Cherryville Road have been approved for single-family residential development. The sites will contain 134 residential units. (PIDs: K3 10 11; L3 6 3)	52	81 DU	Allen Twp
	14 <b>Approved Single Family Development 2</b> – This property has been approved for low-density single-family residential development. (PIDs: L4 1 1; K3 18 1)	137	134 DU	Allen Twp
	15 <b>Approved Single-Family Development 3</b> – This property has been approved for residential development. (PIDs: L4 12 1-63 through L4 12 1-84)	12	50 DU	Allen Twp

MapID	Development Description	Lot Acreage	Building SF / Dwelling Units	Municipality
16	<b>Future Medium-Density Residential</b> – The parcel is currently zoned R2 – Medium Density Residential and is owned by the Jaendl Company. It is anticipated that this site will be developed for residential uses. (PID: L4 15 10)	26	26 DU	Allen Twp
17	<b>Fuller Tract</b> – This property is currently a golf course; preliminary plans are in place for high-density residential development. (PID: M4 6 2)	22	900 DU	Allen Twp
18	<b>Approved Single-Family Development 4</b> – This site is located west of Airport Road and is being considered for single-family residential development use. (PID: L5 13 1)	116	81 DU	East Allen Twp
19	<b>Approved Medium-Density Residential Age-Restricted Development</b> – This parcel is situated west of Beth Bath Pike near the residential developments off Hanoverville Road. This site's first phase of development will entail nearly 100 single-family, duplex, and triplex homes for the private community. In total, the site is expected to eventually host a total of 243 homes. (PIDs: L6 15 7; L6 15 11; L6 15 8; L6 15 8A)	198.6	243 DU	East Allen Twp
TBD	<b>Northampton Area School District</b> – This parcel is affected by the relocation of Seemsville Road and is located adjacent to the Northampton Business Center. No development has been proposed for this parcel. (PID: L5 1 12)	92	TBD	East Allen Township

Source: Municipal Interviews

### LVIA Area Traffic Impact Analysis and Future Growth

#### Traffic Analysis Process

To assess future transportation needs within the study area, a traffic analysis was completed based on the anticipated development locations highlighted in the previous sections of this report. The analysis was used to determine potential traffic volume growth on study-area roadways and intersections and the associated impacts on traffic congestion. These projections, along with stakeholder comments, consultant field views, and engineering judgement, were used to develop strategies to improve mobility and safety within the study area.

Both the PennDOT statewide and Lehigh Valley MPO regional travel demand models were reviewed to identify roadways in the study area that are projected to experience significant increases in total traffic and truck volume. Both travel models indicate relatively small traffic volume growth across the study area but do not consider the potential build-out of the parcels discussed in this study. For the statewide model, truck volume growth was relatively uniform across the study area, with annual growth rates less than 1 percent per year.

FHWA's Freight Analysis Framework (FAF) provides national-level truck traffic volumes for roadways with higher functional classifications (i.e., not local streets). Like the statewide model, the FAF forecasts similar truck volume growth rates across roadways within the study area including PA 145, Airport Road, PA 512, PA 329, and PA 248. The annual truck growth rates are generally around 1.5 percent per year. The FAF does predict nearly 2.5 percent annual growth in trucks on US 22 near the Lehigh Valley Airport.

Due to the limitations of these data sources and their lack of direct consideration of future land use, enhanced traffic forecasts for the study area were developed using a manual process that included the following steps:

#### **1. Determination of Site Characteristics**

The determination of site characteristics is needed to estimate the potential trips generated from each development parcel. Site characteristics are available for developments where existing traffic impact studies (TIS) have been completed. For other development locations, assumptions were made on the types of development that may occur. Determinations considered stakeholder comments, zoning categories, and estimated facility square footage (based on area of the parcel).

#### **2. Trip Generation**

Based on the site characteristics, both auto and truck trips were estimated for each parcel. The generated trips were determined from either the available TIS or from an estimate developed according to methods specified in the Institute of Traffic Engineers (ITE) Trip Generation Manual, 10<sup>th</sup> edition. Consistent with the manual, the following land use categories were used for generating trips:

- Land Use Code 110 – General Light Industrial
- Land Use Code 210 – Single-Family Detached Housing
- Land Use Code 221 – Multifamily Housing (Mid-Rise)
- Land Use Code 251 – Senior Adult Housing – Detached
- Land Use Code 560 – Church

- Land Use Code 710 – General Office Building

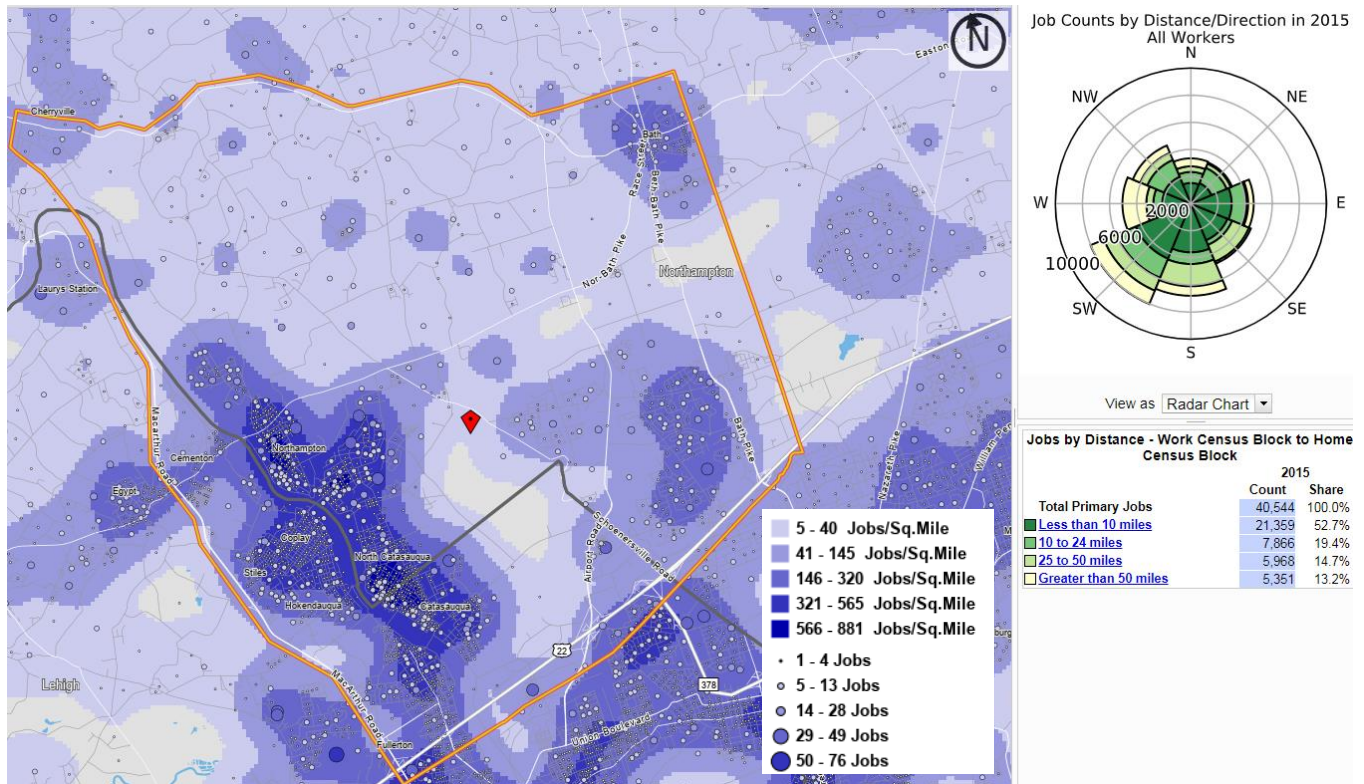
To support traffic analyses, trips were then allocated to the AM and PM peak hours. This allocation process utilized information available from the TIS documents and from StreetLight Origin-Destination analyses at select roadway locations in the region.

### 3. Trip Distribution

Trips generated from each of the developments were distributed to defined locations both inside and outside the study area. Where available the TIS studies provided some insight into the potential distribution of trips; however, in most cases the TIS only distributed trips for a short distance to nearby intersections. Further efforts both for these locations and others were needed to estimate the entire trip movement through the study area.

Assumptions on the origins and destinations of auto trips were based on commuting flow information from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) program (**Figure 22** and **Table 5**). This data set provided insight into the number of auto trips that may stay within the study area or be destined to specific roadways at study-area boundary locations.

**Figure 22: Study-Area Distance/Direction Analysis for All Workers (2015)**



Cardinal Direction	Percentage of Total Trips
Internal	15.0%
North	7.4%
Northeast	7.1%
East	10.2%
Southeast	11.3%
South	14.0%
Southwest	15.0%
West	9.7%
Northwest	10.3%

Information on truck origins and destinations was obtained from the StreetLight origin-destination assessment as discussed in the Profile of Existing Conditions section. Based on typical truck origin and destination locations, assumptions were made on roadway entry/exit points. Using the LEHD commuter distance/direction data and the Streetlight origin-destination data, the AM and PM peak-hour trips were distributed and aggregated for key roadway locations throughout the study area.



#### 4. Traffic Analyses at Select Locations

The traffic analysis for this study was conducted at a planning level. Limited information on existing intersection turning movements prevented detailed analyses using the Highway Capacity Manual 2010 Edition (HCM 2010). However, the relationships between traffic volume and roadway capacity can provide important insight into potential transportation needs, especially with the understanding that many of the development characteristics are still unknown at this time.

The planning-level traffic analysis was conducted with planning software developed by the Florida Department of Transportation (FDOT) for roadways that implement HCM 2010 concepts. ARTPLAN is FDOT's multimodal conceptual planning software for arterial facilities that is based on the HCM's urban streets methodology. For automobile estimates, it provides a simplified Level-of-Service (LOS) analysis of the through movements on a road segment or at a signalized intersection. ARTPLAN uses average travel speed as the service measure. The FDOT ARTPLAN software is a generalized tool for assessing LOS—there are many default assumptions used in deriving the LOS. HIGHPLAN is FDOT's conceptual planning software for two-lane and multilane highways. In developed areas, HIGHPLAN

implements the HCM Class III LOS thresholds based on percent of free-flow speed (PFFS), which is the percentage of vehicles able to travel the road segment at free-flow speed. Both software programs were used to develop a LOS for each study-area roadway segment, depending on the roadway segment characteristics.

Roadway attributes including the number of lanes, average annual daily traffic (AADT), heavy vehicle percentage, segment length, median type, and intersection control characteristics were used to estimate the roadway capacity. Base-year traffic volumes were extracted from PennDOT's Roadway Management System (RMS). Available travel-time information was used to assess current peak-hour congestion and adjust or calibrate the roadway capacity to ensure reasonable results when projecting future traffic volume growth's impact on congestion. The LOS thresholds for two-lane highways and arterial roadways are summarized in **Table 6**.

**Table 6: Relationship Between PFFS and LOS**

LOS	Two-Lane Highways	Arterials	
	PFFS (%)	Class I ATS	Class II ATS
<b>A</b>	> 91.7	> 35 mph	> 30 mph
<b>B</b>	> 83.3 – 91.7	> 31 mph	> 22 mph
<b>C</b>	> 75.0 – 83.3	> 23 mph	> 17 mph
<b>D</b>	> 66.7 – 75.0	> 18 mph	> 13 mph
<b>E</b>	> 58.3 – 66.7	> 15 mph	> 10 mph
<b>F</b>	< 58.3	< 15 mph	< 10 mph

**Table 7** presents LOS for the study-area roadway segments based on average daily traffic (ADT). For the study area, an LOS of D or better is desired. Segments with an LOS of E or F are highlighted red. As described above, the LOS were generated at a high planning level using ARTPLAN and HIGHPLAN methodology. The LOS presented represent a composite LOS calculated based on road segment lengths, ADT, speed limits, heavy vehicle percentage, and directional factor. The LOS were presented in this format due to limited data available. An analysis was done for the study-area roadway segments under existing conditions, as well as future conditions which include a partial build-out (developments for which traffic impact studies are available), and a full build-out (which includes the aforementioned land developments as well as the "Wild Card" parcels as documented in **Figure 21**).

**Table 7: PFFS and LOS Summary for Existing and Future Conditions**

Road	Segment	Existing Condition LOS	Future Condition LOS	
			TIS Developments	TIS & Wild Card Parcels
<b>PA 145 (MacArthur Rd)</b>	Between PA 329 & Roosevelt St.	A	C	C
	Between PA 329 & Columbia St.	B	C	D
<b>PA 248</b>	Between SR 4001 (Blue Mountain Dr.) & SR 3016 (Indian Trail Rd.)	C	C	C

## Lehigh Valley International Airport Area Freight Study

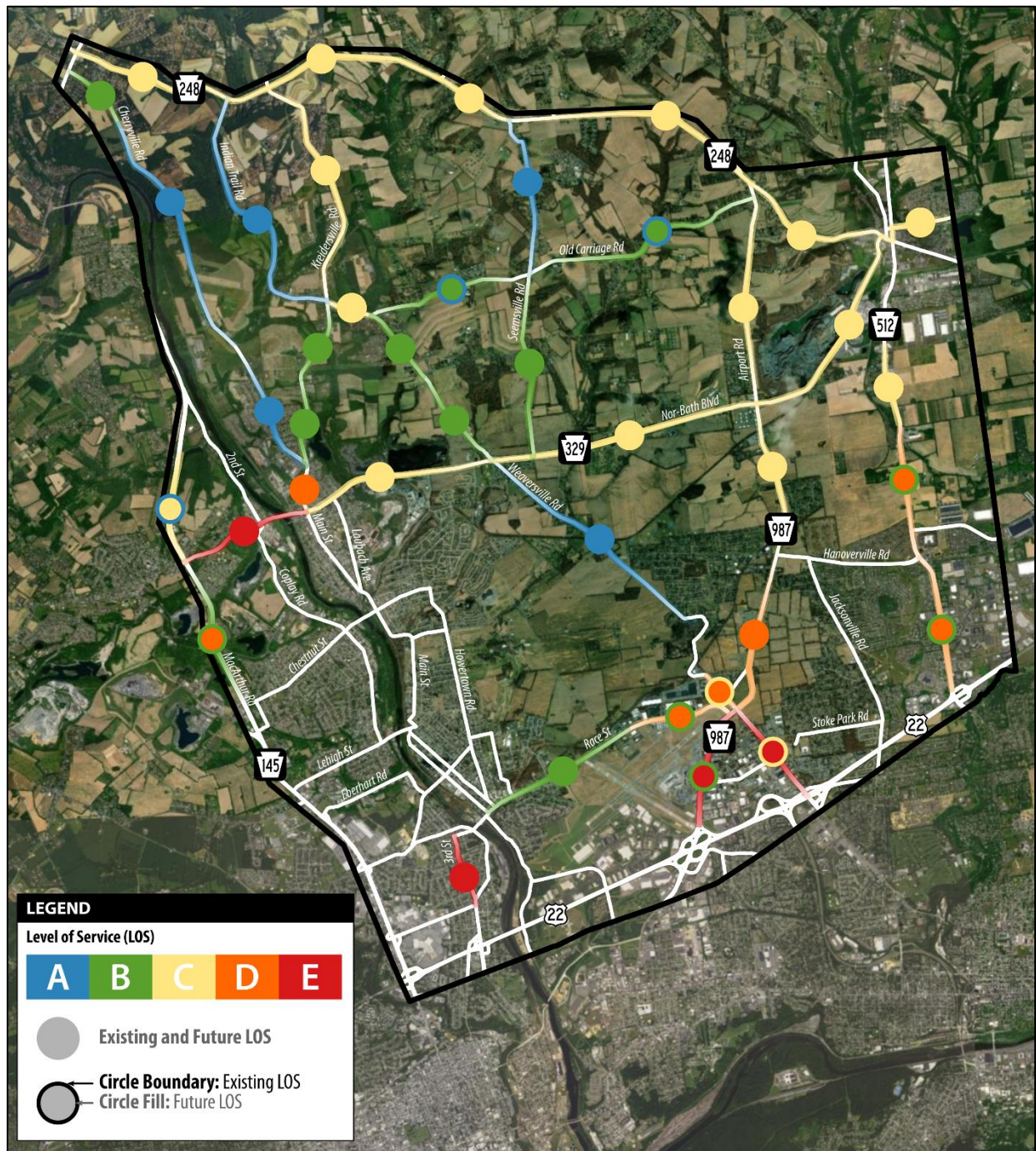
Road	Segment	Existing Condition LOS	Future Condition LOS	
			TIS Developments	TIS & Wild Card Parcels
	Between SR 3016 (Indian Trail Rd.) & SR 4008 (Valley View Dr.)	C	C	C
	Between SR 4008 (Valley View Dr.) & SR 3021 (Seemsville Rd./Allen Dr.)	C	C	C
	Between SR 3021 (Seemsville Rd./Allen Dr.) & SR 3023 (Airport Rd.)	C	C	C
	Between SR 3023 (Airport Rd.) & PA 329 (Race St.)	C	C	C
	Between PA 329 (Race St) & Wolf St.	C	C	C
PA 329	Between PA 248 & SR 3023 (Airport Rd.)	C	C	C
	Between SR 3023 (Airport Rd.) & SR 3017 (Weaversville Rd./Howertown Rd.)	C	C	C
	Between SR 3017 (Weaversville Rd./Howertown Rd.) & Main St.	C	C	C
	Between Main St. & SR 145 (MacArthur Rd.)	E	E	E
	Between SR 145 (MacArthur Rd.) & SR 4008 (Cement St.)	C	D	D
PA 512 (Bath Pike)	Between Silver Crest Rd & Locust Rd.	C	C	C
	Between Locust Rd & SR 3014 (Hanoverville Rd.)	B	C	D
	Between SR 3014 (Hanoverville Rd.) & US 22	B	C	D
PA 987 (Airport Rd)	Between US 22 & SR 1004 (Race St.)	E	E	E
	Between SR 1004 (Race St) & SR 3014 (Hanoverville Rd.)	D	D	D
	Between SR 3014 (Hanoverville Rd.) & PA 329	C	C	C
SR 1004 (Race St)	Between PA 987 (Airport Rd.) & Fashion Dr.	B	C	D
	Between Fashion Dr. & Second St.	B	B	B
PA 1009 (Schoenersville Rd)	Between Colonial Rd. & PA 987 (Airport Rd.)	C	C	D
	Between PA 987 (Airport Rd.) & US 22	C	D	E

Road	Segment	Existing Condition LOS	Future Condition LOS	
			TIS Developments	TIS & Wild Card Parcels
<b>SR 1015 (Third St)</b>	Between Grape St. & SR 1004 (Bridge St.)	E	E	E
<b>SR 3016 (Indian Trail Rd)</b>	Between PA 248 & SR 3018 (Old Carriage Rd.)	A	A	A
<b>SR 3017 (Weaversville Rd/Howertown Rd)</b>	Between SR 3018 (Old Carriage Rd.) & SR 4003 (Kreidersville Rd.)	C	C	C
	Between SR 3018 (Old Carriage Rd) & Mud Lane	B	B	B
	Between PA 329 & Mud Lane	B	B	B
	Between PA 329 & Jendy Lane	A	A	A
<b>SR 3018 (Old Carriage Rd)</b>	Between SR 3023 (Airport Rd.) & SR 3021 (Seemsville Rd/Allen Dr.)	A	B	B
	Between SR 3021 (Seemsville Rd./Allen Dr.) & SR 3017 (Weaversville Rd.)	A	B	B
<b>SR 3019 (Cherryville Rd)</b>	Between SR 4001 (Blue Mountain Dr.) & Locust Dr.	B	B	B
	Between Locust Dr & Kohls Rd.	A	A	A
	Between Kohls Rd. & SR 4003 (Kreidersville Rd.)	A	A	A
<b>SR 3021 (Seemsville Rd/Allen Dr)</b>	Between PA 248 & SR 3018 (Old Carriage Rd.)	A	A	A
	Between SR 3018 (Old Carriage Rd.) & PA 329	B	B	B
<b>SR 3023 (Airport Rd)</b>	Between PA 329 & PA 248	C	C	C
<b>SR 4003 (Kreidersville Rd)</b>	Between PA 329 & SR 3019 (Cherryville Rd.)	D	D	D
	Between SR 3019 (Cherryville Rd.) & Lappawinzo Rd.	B	B	B
	Between Lappawinzo Rd & SR 3017 (Weaversville Rd./Howertown Rd.)	B	B	B
	Between SR 3017 (Weaversville Rd/Howertown Rd.) & PA 248	C	C	C

Source: Michael Baker International calculations

Of the 41 segments included in the traffic analysis, 30 did not experience a significant change in LOS with full build-out. In other words, the new trips generated and distributed from the TIS and “Wild Card” parcels did not impact the segments enough for the existing LOS figure to change appreciably. The remaining 11 segments experienced a decrease in LOS. **Figure 23** depicts the LOS impacts of a full build-out scenario where TIS and “Wild Card” parcels are developed.

Figure 23: Existing and Future LOS Changes for Road Segments within the Study Area



Source: Michael Baker International calculations and PennDOT Approved Traffic Impact Studies

The following five segments experienced the largest reduction in free-flow speed between existing conditions and future conditions in the traffic analysis:

- PA 1009 (Schoenersville Road) between PA 987 (Airport Road) & US 22 – LOS decrease from C to E. As this segment already experiences heavy traffic during the peak hours, it is expected that future developments will worsen congestion.
- SR 1004 (Race Street) between PA 987 (Airport Road) and Fashion Drive – LOS decrease from B to D.
- PA 987 (Airport Road) between US 22 and SR 1004 (Race Street) – LOS decrease from B to E.
- PA 329 between Main Street and PA 145 (MacArthur Road) – No LOS decrease, however the existing and future conditions experience an LOS E. As this segment also experiences heavy traffic during the peak hours, it is expected that future developments will also worsen congestion on this segment.
- PA 145 (MacArthur Road) between PA 329 and Columbia Street (LOS decrease from D to E).

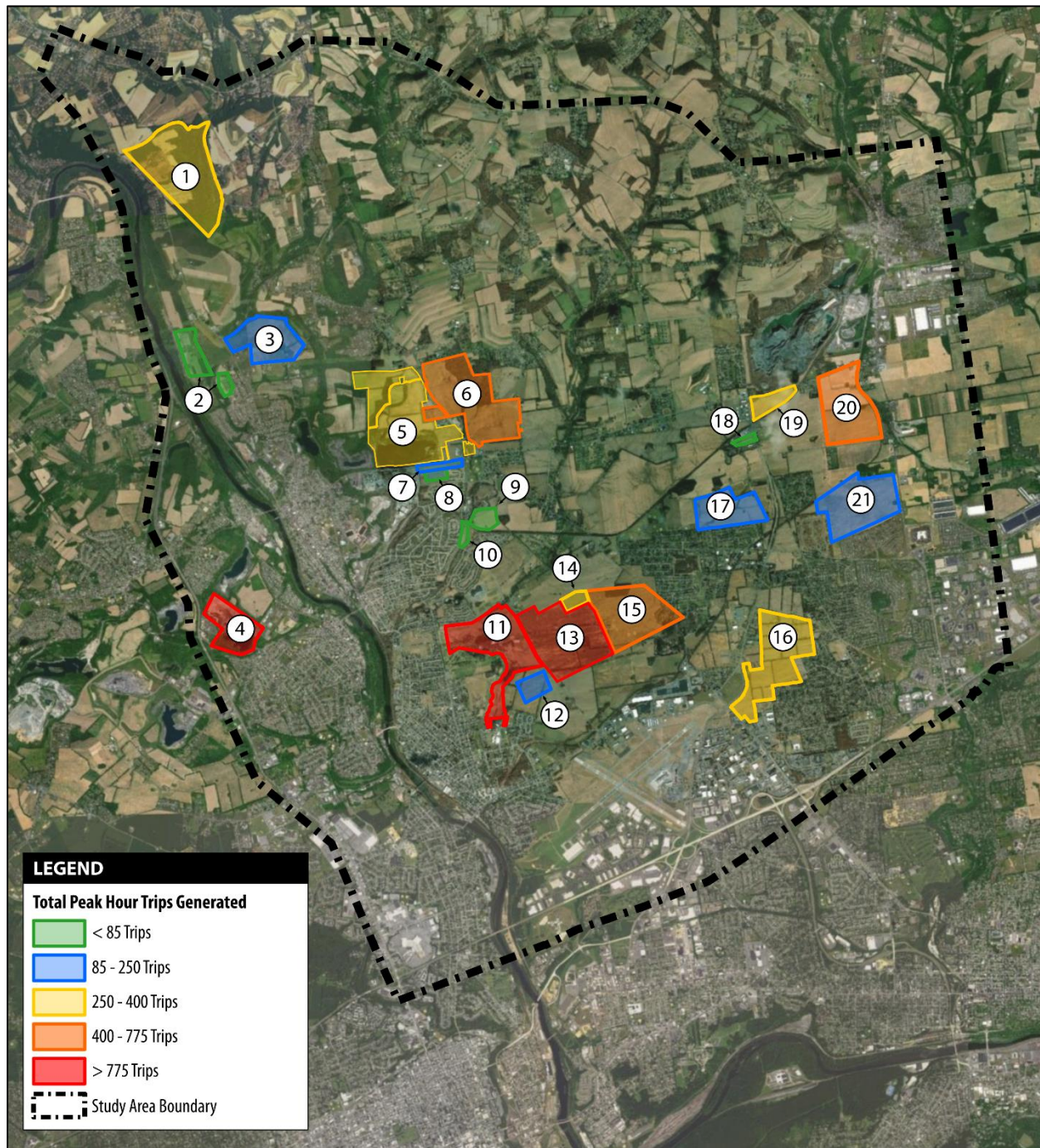
As the study area is experiencing development, future analysis and planning is required to ensure that the road network operates sufficiently. Many of the study-area road segments operate at LOS E currently and in projected future conditions; improvements will need to be made in the future to improve capacity.

### Estimated Trip and Traffic Volume Growth

**Figure 24** highlights the daily truck and auto peak-hour trips generated from each of the study-area parcels. **In total, approximately 10,856 total daily peak-hour trips are estimated to be generated from new development, including 2,927 trucks.** The daily trips were allocated to the AM and PM peak hours to support traffic analyses. The total AM and PM peak-hour trips are estimated to be 3,871 (1,228 trucks) and 3,685 (1,699 trucks) trips, respectively. A breakdown of AM and PM peak hour trips by study area parcel is included in **Table 8**.<sup>10</sup>

<sup>10</sup> Auto and truck trips were distributed as part of two development scenarios, including: 1) a partial build-out consisting of the planned developments for which a TIS has been completed (Scenario 1) and 2) a full build-out consisting of all the identified development parcels (Scenario 2). Note that any parcel designated for agriculture preservation does not produce any vehicle trips. Traffic volume increases in both scenarios included a background growth rate determined from the average annual growth identified within the project study area in the Lehigh Valley Travel Demand model.

Figure 24: Peak Period Trips Generated from Study Area Parcels



Source: Michael Baker International calculations and PennDOT Approved Traffic Impact Studies

Table 8: Peak Period Trips Generated from Study-Area Parcels

Map ID	Parcel Name	AM Cars	AM Trucks	AM Total	PM Cars	PM Trucks	PM Total	Peak Total
1	Mary Immaculate Property	152	50	202	124	67	191	393
2	Approved Single-Family Development 1	15	5	20	16	8	24	44
3	Approved Single-Family Development 2	80	27	107	93	50	143	250
4	Former Mineral Extraction Site	824	274	1098	941	507	1448	2546
5	Northampton Industrial Park*	130	48	178	132	63	195	373
6	Northampton Business Center*	197	74	271	204	97	301	572
7	Commercial Zone	76	26	102	65	35	100	202
8	Approved Single-Family Development 3	17	6	23	18	10	28	51
9	Future Medium-Density Residential	14	5	19	16	9	25	44
10	Approved Strip Mall	17	6	23	19	10	29	52
11	Fuller Tract	360	120	480	432	232	664	1144
12	Rockefeller Lot 5	92	32	124	92	43	135	259
13	FedEx*	874	266	1140	874	266	1140	2097
14	Rockefeller Lot 4	23	9	32	23	12	35	67
15	LNAA Tract	301	100	401	237	128	365	766
16	Aircraft Flight Path Property	117	39	156	117	39	156	322
17	Approved Single-Family Development 4	50	17	67	57	31	88	155
18	Property Zoned Light Industrial / Business Park	36	12	48	24	13	37	85
19	Airport Lot 1*	176	13	189	138	18	156	345
20	Property Rezoned	283	94	377	224	121	345	722
21	Future Low-Density Residential	74	25	99	77	42	119	218
<b>TOTAL</b>		<b>3,908</b>	<b>1,248</b>	<b>5,156</b>	<b>3,923</b>	<b>1,801</b>	<b>5,724</b>	<b>10,707</b>

\*PennDOT-approved Traffic Impact Study is available for this parcel

### Recommendations

Major recommendations flowing out of this study are organized into three primary areas:

1. **Capital projects** to ease congestion for both motorists and heavy truck operators. In some cases, additional study and evaluation would be required during preliminary engineering phases to determine the project's proper scope.
2. **Operational improvements** to enhance system operations at specific intersections and along certain roadways.
3. **Land use policies and multimunicipal approaches** to address the study area's collective issues. These range from land use management ordinances, to land use management techniques, to changes in federal roadway functional class. Land use policies can often create conflicts with incompatible neighboring land uses, and can be inconsistent, particularly when weighed against the area's freight transportation system. Truck-generating uses need to be strategically located within the study area.

### Capital Improvements

1. **For freight shippers, *reliability* is a vital transportation consideration. As new land development proposals are submitted, LVTS should monitor the anticipated impacts to capacity and free-flow speed on the primary roadway segments identified through the study process. LVPC and PennDOT District 5-0 should use the land development and HOP process to study and complete improvements at the time of development.** These include the following major roadway segments, which are expected to experience significant declines in levels of service and should be added as candidate projects to the region's Long-Range Transportation Plan:
  - a. Schoenersville Road (SR 1009) between PA 987 (Airport Road) and US 22.
  - b. Race Street (SR 1004) between Airport Road (PA 987) and Fashion Drive.
  - c. Airport Road (PA 987) between US 22 and Race Street (SR 1004).
  - d. PA 329 between Main Street and MacArthur Road (PA 145).
  - e. MacArthur Road (PA 145) between PA 329 and Columbia Street.

### Operational Improvements

2. **Expand fixed-route and deviated public transportation service in the study area** – LANTA's service within the study area currently meets the demand for job access and service span with its fixed-route network; however, continued growth in the area may expand service needs. One corridor identified as a potential future fixed route would connect the boroughs of Northampton and Bath along PA 329, continuing to the Borough of Nazareth outside the study area. The inclusion of this corridor in the fixed-route network would be bolstered by planned developments of the Northampton Business Center and Northampton Industrial Park near the intersection of PA 329 and Howertown Road.

In addition to fixed-route service, LANTA provides a reservation-based curb-to-curb transit service called LANTAFlex. This service is useful in areas of low-density destinations with fluctuating demand.

While there are currently no LANTAFlex zones in the study area, the growth in low-density developments across the northern and eastern areas of the study area may produce an opportunity to add this service. This potential service could cover the entire northern half of the study area and provide connections to industrial park developments from fixed-route services in Northampton and along PA 329 (should service be added).

- 3. Upgrade Mill Street as a truck route** – Improving Mill Street (and specifically the Mill Street bridge), a locally-owned street in Bath Borough, is a recommendation of the Bath Multimodal Study and Parking Analysis Report. The roadway connects PA 512 with PA 987 and includes a bridge spanning Monocacy Creek which is currently posted at 6 tons. Trucks are currently prohibited from using the roadway. Opening the roadway to truck traffic (and promoting it as a truck route) would help decongest downtown Bath. This recommendation would be implemented in tandem with a corresponding initiative by the Borough to implement upgraded signal control and coordination at four key intersections. (The borough’s signalized intersections operate on a timed system, with no designated turning lanes.) It should be noted that the bridge (Northampton County Bridge #115), once replaced, will not have a posted weight restriction, but was not designed to accommodate a proposed increase in truck traffic, thereby shortening its life span, and inducing increased maintenance costs to the County. Further discussions between the County, PennDOT, and the Borough are necessary regarding any implementation of this recommendation.

The recommendation also entails LVPC adding the intersection of PA 512 and Mill Street to the LRTP. The proposal would include a signal warrant analysis of Mill Street’s intersections with PA 512/Walnut Street and Race Street (PA 329/987). Bath Borough is a gateway to and from the study area. New development east of the borough (and just outside of the defined study area) will add to travel demand through the borough. The borough, despite being only one square mile in size, has a dense network of roadways totaling nearly 11 linear miles, nearly half of which are state-owned. The borough is looking to reduce traffic congestion through operational improvements to its signal network, and is also considering instituting a series of one-way streets.

Mill Street compares favorably with alternative truck routes, such as East Allen Township’s Jacksonville Road, a locally-owned roadway located 1.1 miles farther south which also has a bridge spanning Monocacy Creek, but is currently posted at 13 tons. Other impediments to using Jacksonville Road as a truck route include an at-grade crossing of Norfolk Southern right-of-way, the Northampton County Nor-Bath Trail crossing, and a community park (Jacksonville Park) with poor access management providing free access from the roadway to off-street parking spaces. The roadway also intersects with PA 987 at a skewed angle.



**Mill Street in Bath Borough is proposed for upgrades as a truck route to reduce truck traffic in the downtown area**

- 4. Raise the signal heads/signs at the intersection of PA 987 (Airport Road) and SR 3014 (Hanoverville Road) in East Allen Township** – The intersection of PA 987 (Airport Road) and SR 3014 (Hanoverville Road) experiences heavy vehicles hitting signal heads and signs on the mast arm facing the southbound approach of PA 987 (Airport Road). The Left Turn Yield on Green sign is tilted and the backplates of the signal heads are also bent.

According to LiDAR data, the height clearance for the signs/signal heads is approximately 14.5 feet, which is substandard clearance. According to PennDOT Publication 149 (Traffic Signal Design Handbook), the bottom of the signal face shall be a minimum of 15 feet above the pavement grade. It is recommended that the brackets attaching the signal heads and signs to the mast arm be raised to allow for additional clearance. After the signal heads and signs are raised, it is also recommended to monitor the intersection to see if the signal heads/signs continue to be hit. If collisions continue, it is recommended that the mast arm be raised and the signal equipment be replaced.



**Vertical clearance for the signal heads at the intersection of Airport Road and Hanoverville Road is substandard, resulting in damaged signs and equipment**

## Land Use Policies

5. **It is recommended East Allen Township revise its Official Map to include a corridor linking PA 329 to Weaversville Road (SR 3017)** – The position of Weaversville Road in connecting the interior of the study area (including the Northampton Business Center and Northampton Industrial Park) with US 22 means it will experience significant increases in travel demand in coming years. The passage of Act 31 of 2018 may only contribute to the demand for travel along this roadway.<sup>11</sup>

The purpose of an Official Map is to reserve private property and/or corridors for future public use. It legally establishes the location of existing and proposed streets and other public facilities within a municipality. The intent of the recommendation would also be to notify affected land owners and developers concerning the location of future planned improvements. Thus, it reserves strategic real estate without immediate purchase.

The initiative is part of a broader concern aimed at creating a truck route connecting PA 329 Nor-Bath Boulevard with Weaversville Road. The intent of the recommendation is to create more favorable conditions for trucks traveling north/south on the Weaversville Road corridor between new distribution centers on PA 329 and US 22. The corridor would be approximately a third of a mile long and allow trucks to bypass a residential area surrounding Howertown Park. The route would intersect with PA 329 at its planned intersection with Seemsville Road (SR 3021).



**A corridor linking Weaversville Road with the realigned intersection of Seemsville Road and Nor Bath Boulevard is recommended to facilitate the future movement of truck traffic**

<sup>11</sup> PennDOT has placed a “No Trailers Over 45’ long” restriction on the roadway in place of the current “No 102” signs.

6. **Ensure improvements are secured from developers and other stakeholders to realign Weaversville Road (SR 3017) and improve its connection to PA 987** – At the southern extent of Weaversville Road, the roadway features challenging geometry for trucks. The potential future development of the LNAA lot to the east of the FedEx/Lot 4 area to a “logistics center” use has the potential to generate up to approximately 1,600 additional truck trips and radically change the traffic profile along Weaversville Road. Any future development of this parcel will load traffic directly onto Weaversville Road.



**The municipal Official Map should identify corridors to be preserved for future public improvement, i.e., the realignment of Weaversville Road to Airport Road**

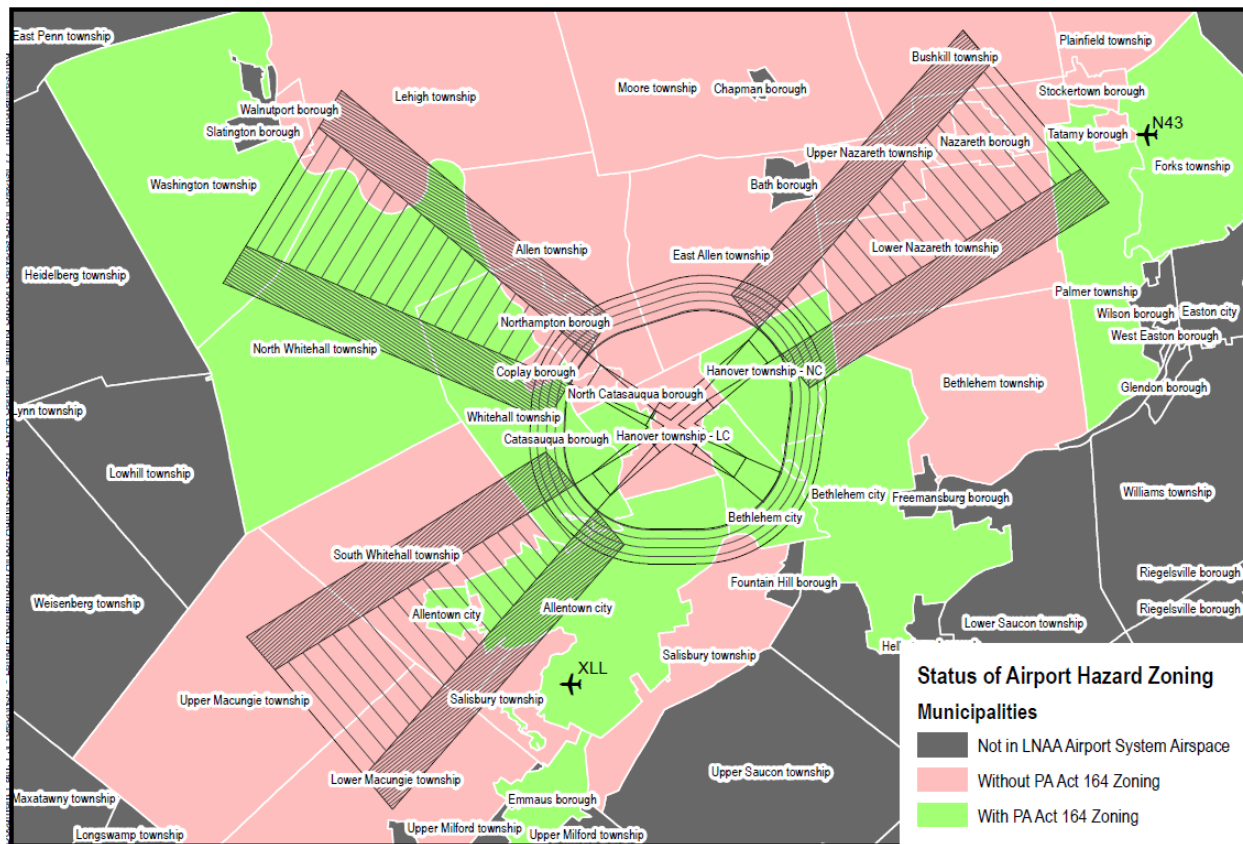
Hanover Township in its Official Map has identified a corridor between Innovation Drive and Weaversville Road that should be considered as a new alignment for Weaversville Road as the corridor develops.

A realigned Weaversville Road would improve safety and also remove truck traffic from existing residential areas at Weaversville Road’s southern extent. PennDOT has posted the corridor with a “No Trailers Over 45’ Long” restriction in place of the “No 102” signs.

Any realignment of Weaversville Road should be assessed to ensure conformance with LVIA’s Airport Layout Plan.

7. **Promote the adoption of Act 164 Airport Hazard Zoning** – Air cargo and passenger traffic is growing; LVIA will require compatible surrounding land development in order to remain viable. Several municipalities within the study area do not have Act 164 Airport Hazard Zoning. These include: Allen Township, Coplay Borough, East Allen Township, Hanover Township (Lehigh County), Lehigh Township (Northampton County), and Northampton Borough. The intent of the recommendation is not to stifle development, but to ensure that planned development helps maintain the safety and viability of LVIA’s passenger and commercial operations. **Figure 25** shows the status of Act 164 Airport Hazard Zoning in municipalities adjacent to LVIA while **Appendix F** depicts a complete listing in tabular format.

Figure 25: Status of Airport Hazard Zoning: LVIA



Source: LNAA

8. **Adjust performance standards in municipal zoning ordinances** – Certain municipalities, such as Allen Township, have modified their zoning ordinance to require truck parking accommodation as part of major warehousing and distribution center land developments. The provision keeps truck traffic on these commercial/industrial properties. This recommendation could be implemented in tandem with development of LVPC’s forthcoming freight toolkit. Providing on-site truck parking would help address a larger regional, systemic problem—with insufficient truck stops and other designated parking available, truck drivers are forced to park in non-designated areas (shoulders, on- and off-ramps, etc.) that were not designed to sustain those loads. This recommendation addresses a growing public policy issue and addresses safety and environmental concerns.
9. **Implement a Recommended Truck Route Network as a planning tool** - The intermingling of truck traffic with overall vehicular traffic has been a consistent concern expressed throughout the study process. The study is advancing the concept of a recommended truck route network, as shown previously in **Figure 20**. The proposed truck network has been overlaid with parcels within the study area that municipalities have zoned for truck-related or freight-generating uses. The network can be used as a tool by LVTS in consultation with municipal planners as decisions are being made regarding proposed changes to land use, over time. Ideally, parcels that are not located adjacent to

a proposed truck route would be discouraged from accommodating uses that would generate heavy truck traffic.

The proposed truck network predominately features Principal Arterials that can accommodate growth in truck traffic.<sup>12</sup> Municipalities such as East Allen have no infrastructure north of PA 329, and the soils are not favorable north of that corridor for onsite water and sewer. Other lots in Allen Township north of the roadway have been proposed for downzoning to less intensive, residential uses.

**10. Address noise reduction** - Related to the Truck Route Network recommendation above, study-area municipalities should consider enacting engine brake (“Jake brake”) prohibitions on non-truck-route network roadways to address noise concerns of residential property owners. Study-area municipalities can play a role in managing environmental impacts created by truck-generating uses, and can help industrial uses such as warehouses and distribution centers be “good neighbors” to the study area’s existing residential areas and neighborhoods by mitigating excessive noise.

**11. Pursue functional classification upgrades on PA 329 and PA 987 from Minor Arterial to Principal Arterial** - The passage of the FAST Act in December 2015 provided new guidance to state DOTs and MPOs regarding the classification of roadways: Principal Arterials are expected to connect to other Principal Arterials (or Interstates) as a closed system. The study area features two examples where roadways classified as Principal Arterials do not satisfy this requirement:

- a. PA 329 (Nor-Bath Boulevard) changes classification from Principal Arterial to Minor Arterial at Catasauqua Creek in East Allen Township.
- b. PA 987 (Airport Road) is a Principal Arterial between US 22 and SR 1009 (Schoenersville Road). North of that intersection, it is classified as a Minor Arterial.

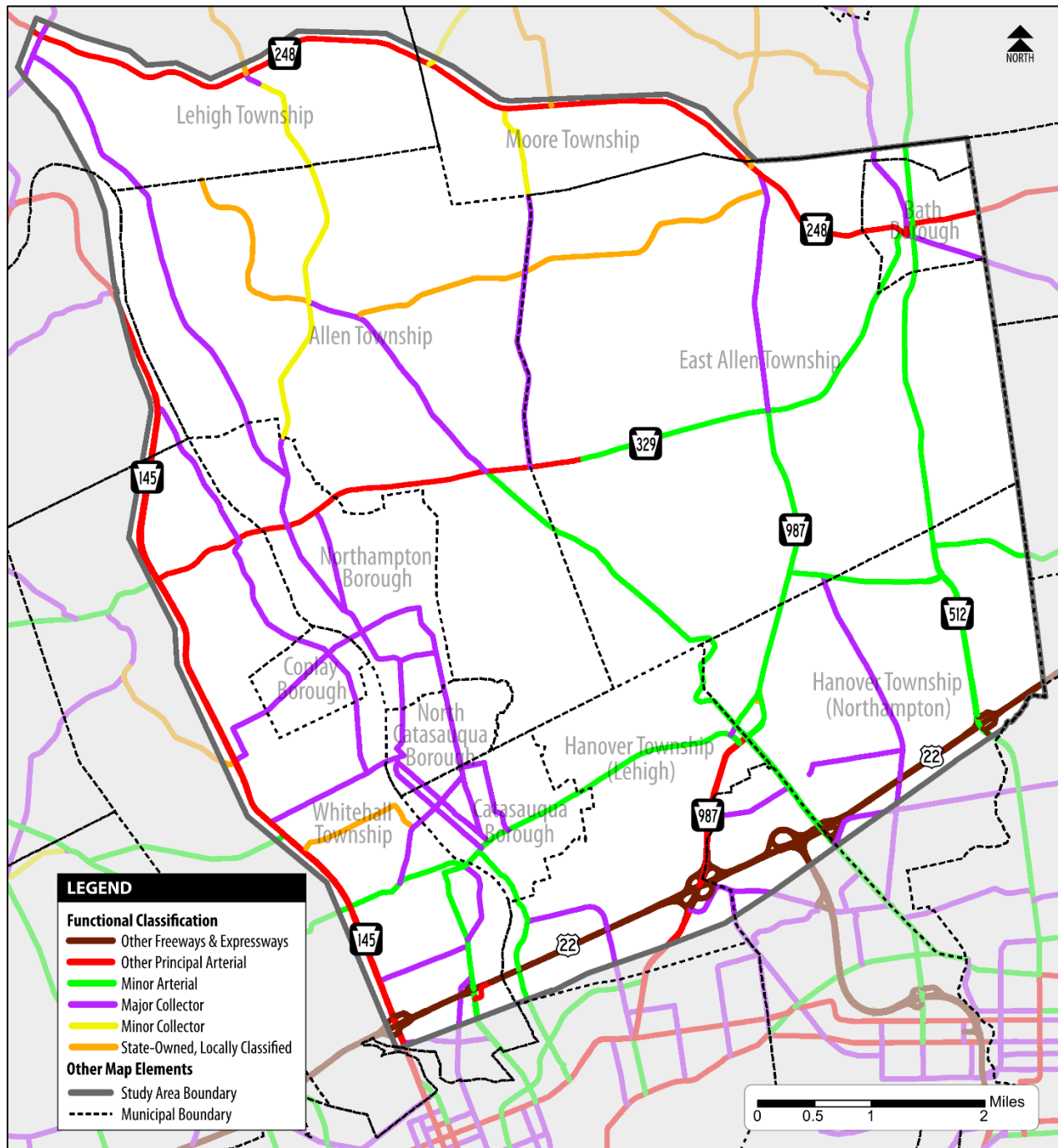
LVTS is encouraged to approach FHWA and PennDOT’s Bureau of Planning and Research to initiate changes to functional classification within the study area. This could be performed as a stand-alone request or added to a future biennial work program as part of a broader effort encompassing the entire region. Successful upgrades of these portions of PA 329 and PA 987 from Minor Arterials to Principal Arterials would make these two roadways eligible for National Highway Performance Program (NHPP) funding, which, at an estimated \$33 million a year, is by far the MPO’s most significant funding category. A proposed change on PA 329 could also be extended to its intersection with PA 248 in Bath Borough.

**Figure 26** shows the study area’s existing functional classification scheme.

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<sup>12</sup> An exception would include PA 329 in Whitehall

Figure 26 Study-Area Roadway Functional Classification



Source: PennDOT Roadway Management System (RMS)

### **12. Consider creating a Transportation Development District (TDD) or a Transportation Impact Fee District -**

A Transportation Development District (TDD), as authorized under the Transportation Partnership Act (TPA), is a relatively underutilized transportation financing tool that has been in place since the 1980s. Key factors that reportedly dissuade municipalities from adopting a TDD are: obtaining property owner buy-in and agreement, vague regulatory requirements, and upfront planning and transportation study costs.

A few municipalities that have successfully deployed a TDD have done so in conjunction with financing the district through a companion Local Economic Revitalization Tax Assistance Act (LERTA) district, often known as a LERTA RAP (Revenue Allocation Program). Under this financing mechanism enabled through the TPA, property owner abatements under LERTA are voluntarily applied toward property owner assessments as part of the TDD and used to fund transportation improvements in the established TDD.







Where municipalities have studied establishing a TDD but have opted not to do so, tools such as Transportation Impact Fees, Tax Increment Financing (TIF), the Pennsylvania Infrastructure Bank (PIB), or municipal-wide tax increases have been used to fund or finance transportation improvement projects.

Further details regarding the use of Transportation Development Districts in Pennsylvania are provided in **Appendix G: Transportation Development District Overview**.

Appendix A: INRIX Travel Time and Planning Index Summary

## Appendix H – INRIX Travel Time and Planning Time Index Summary by Corridor

### Appendix: INRIX Travel Time and Planning Time Index Summary by Corridor

TTI			PTI		
	<1.3	Uncongested		<1.3	Reliable
	1.3-1.6	Moderate		1.3-1.6	Moderately Unreliable
	> 1.6	Severe Congestion		> 1.6	Highly Unreliable

MacArthur Road (US 22 to Schadt Avenue)												
Day of Week	Northbound						Southbound					
	Travel time index			Planning time index			Travel time index			Planning time index		
	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM
Monday	1.1	1.2	1.4	1.4	1.7	2.1	1.2	1.5	1.6	1.6	2.1	2.3
Tuesday	1.1	1.2	1.4	1.5	1.7	2.0	1.2	1.5	1.5	1.6	2.1	2.1
Wednesday	1.1	1.2	1.4	1.6	1.7	2.3	1.2	1.5	1.5	1.6	2.1	2.3
Thursday	1.1	1.2	1.4	1.4	1.7	2.1	1.2	1.5	1.8	1.5	2.1	2.5
Friday	1.1	1.3	1.4	1.6	2.0	2.1	1.2	1.7	1.8	1.5	3.0	3.0
Saturday	1.0	1.4	1.5	1.3	2.1	2.1	1.0	1.9	2.8	1.4	3.7	4.9
Sunday	0.9	1.3	1.3	1.1	2.1	2.0	0.9	1.5	1.8	1.1	2.5	3.0
Weekends	1.0	1.4	1.4	1.2	2.1	2.1	1.0	1.7	2.3	1.2	3.3	4.2
Weekdays	1.1	1.2	1.4	1.5	1.7	2.1	1.2	1.5	1.6	1.6	2.3	2.5
All Days	1.1	1.3	1.4	1.4	1.8	2.1	1.1	1.6	1.8	1.5	2.5	3.3

Airport Road (US 22 to Schoenersville Road)												
Day of Week	Northbound						Southbound					
	Travel time index			Planning time index			Travel time index			Planning time index		
	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM
Monday	1.1	1.1	1.3	1.6	1.7	2.1	1.4	1.3	1.6	2.4	2.1	2.9
Tuesday	1.1	1.2	1.4	1.7	1.7	2.1	1.6	1.3	1.8	2.7	2.2	3.3
Wednesday	1.1	1.2	1.3	1.7	1.7	2.0	1.5	1.3	1.9	2.5	2.3	3.8
Thursday	1.1	1.2	1.4	1.6	1.8	2.4	1.5	1.3	1.9	2.7	2.3	3.8
Friday	1.1	1.2	1.4	1.5	1.7	2.2	1.4	1.5	1.9	2.2	2.8	3.6
Saturday	1.0	1.1	1.1	1.3	1.5	1.6	1.0	1.1	1.0	1.3	1.5	1.5
Sunday	0.9	1.0	1.0	1.1	1.4	1.3	1.0	1.0	1.0	1.3	1.4	1.4
Weekends	1.0	1.0	1.1	1.2	1.4	1.5	1.0	1.0	1.0	1.4	1.5	1.4
Weekdays	1.1	1.2	1.4	1.6	1.7	2.1	1.5	1.3	1.8	2.5	2.3	3.4
All Days	1.1	1.1	1.3	1.5	1.7	2.0	1.3	1.3	1.6	2.4	2.1	3.2

Airport Road Road (Hanoverville Road to PA 329)												
Day of Week	Northbound						Southbound					
	Travel time index			Planning time index			Travel time index			Planning time index		
	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM
Monday	1.1	1.1	1.4	1.5	1.4	2.1	1.1	1.0	1.0	1.3	1.2	1.2
Tuesday	1.1	1.1	1.6	1.5	1.3	2.3	1.1	1.0	1.1	1.4	1.2	1.3
Wednesday	1.1	1.1	1.6	1.5	1.4	2.4	1.1	1.0	1.1	1.3	1.2	1.2
Thursday	1.1	1.1	1.6	1.5	1.4	2.4	1.1	1.0	1.1	1.5	1.2	1.3
Friday	1.1	1.1	1.4	1.4	1.4	2.1	1.1	1.0	1.1	1.3	1.2	1.2
Saturday	1.0	1.0	1.0	1.1	1.2	1.2	1.0	1.0	1.0	1.1	1.1	1.1
Sunday	1.0	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.1	1.1
Weekends	1.0	1.0	1.0	1.1	1.1	1.2	1.0	1.0	1.0	1.1	1.1	1.1
Weekdays	1.1	1.1	1.5	1.5	1.4	2.3	1.1	1.0	1.1	1.4	1.2	1.3
All Days	1.1	1.1	1.4	1.4	1.3	2.2	1.1	1.0	1.0	1.3	1.2	1.2

Schoenersville Road (US 22 to Airport Road)												
Day of Week	Northbound						Southbound					
	Travel time index			Planning time index			Travel time index			Planning time index		
	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM
Monday	1.2	1.2	1.4	1.8	1.7	2.0	1.3	1.2	1.3	1.9	1.8	1.9
Tuesday	1.3	1.2	1.5	1.8	1.7	2.1	1.4	1.3	1.4	1.9	1.8	2.1
Wednesday	1.3	1.2	1.4	1.8	1.8	2.1	1.4	1.3	1.4	2.1	1.8	2.1
Thursday	1.3	1.2	1.5	1.8	1.8	2.1	1.4	1.2	1.4	2.1	1.8	1.9
Friday	1.2	1.3	1.5	1.7	1.8	2.1	1.4	1.3	1.3	1.9	1.8	1.8
Saturday	1.0	1.1	1.0	1.4	1.4	1.4	1.1	1.1	1.1	1.5	1.6	1.5
Sunday	0.9	1.0	1.0	1.3	1.3	1.3	1.0	1.0	1.1	1.5	1.4	1.4
Weekends	1.0	1.0	1.0	1.3	1.4	1.4	1.1	1.1	1.1	1.5	1.5	1.4
Weekdays	1.3	1.2	1.4	1.8	1.8	2.1	1.4	1.3	1.4	1.9	1.8	1.9
All Days	1.2	1.2	1.3	1.7	1.7	2.0	1.3	1.2	1.3	1.9	1.8	1.8

Jacksonville Road (US 22 to Hanoverville Road)												
Day of Week	Northbound						Southbound					
	Travel time index			Planning time index			Travel time index			Planning time index		
	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM
Monday	1.0	1.0	1.0	1.3	1.3	1.3	1.1	1.2	1.3	1.5	1.5	1.7
Tuesday	1.0	1.1	1.0	1.3	1.3	1.3	1.2	1.3	1.3	1.5	1.6	1.8
Wednesday	1.0	1.0	1.0	1.3	1.3	1.3	1.2	1.3	1.3	1.6	1.7	1.8
Thursday	1.0	1.0	1.0	1.3	1.3	1.3	1.2	1.3	1.3	1.5	1.6	1.8
Friday	1.0	1.1	1.0	1.3	1.3	1.3	1.1	1.3	1.3	1.5	1.7	1.7

Saturday	0.9	1.0	0.9	1.1	1.3	1.2	1.0	1.1	1.1	1.2	1.5	1.5
Sunday	0.9	0.9	0.9	1.1	1.2	1.2	0.9	1.1	1.1	1.1	1.4	1.4
Weekends	0.9	1.0	0.9	1.1	1.3	1.2	1.0	1.1	1.1	1.1	1.5	1.5
Weekdays	1.0	1.1	1.0	1.3	1.3	1.3	1.2	1.3	1.3	1.5	1.6	1.8
All Days	1.0	1.0	1.0	1.3	1.3	1.3	1.1	1.2	1.3	1.5	1.6	1.7

Race Street (Willow Brook Road to Airport Road)												
Day of Week	Eastbound						Westbound					
	Travel time index			Planning time index			Travel time index			Planning time index		
	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM
Monday	1.2	1.1	1.1	1.9	1.7	1.6	1.1	1.2	1.4	1.7	2.3	2.8
Tuesday	1.3	1.1	1.1	2.1	1.8	1.6	1.1	1.2	1.6	1.6	2.0	3.3
Wednesday	1.2	1.1	1.1	2.0	1.8	1.6	1.1	1.2	1.5	1.5	2.2	2.8
Thursday	1.2	1.2	1.1	1.8	1.9	1.5	1.1	1.3	1.6	1.5	2.4	3.3
Friday	1.2	1.2	1.1	1.9	1.9	1.5	1.1	1.3	1.5	1.5	2.4	2.8
Saturday	1.0	1.0	1.0	1.2	1.2	1.2	1.0	1.0	1.0	1.1	1.2	1.1
Sunday	0.9	1.0	0.9	1.1	1.1	1.1	0.9	0.9	0.9	1.0	1.1	1.1
Weekends	0.9	1.0	1.0	1.2	1.2	1.2	0.9	1.0	1.0	1.1	1.1	1.1
Weekdays	1.2	1.2	1.1	1.9	1.8	1.5	1.1	1.2	1.5	1.5	2.3	3.1
All Days	1.1	1.1	1.1	1.8	1.7	1.5	1.1	1.2	1.3	1.4	2.0	2.8

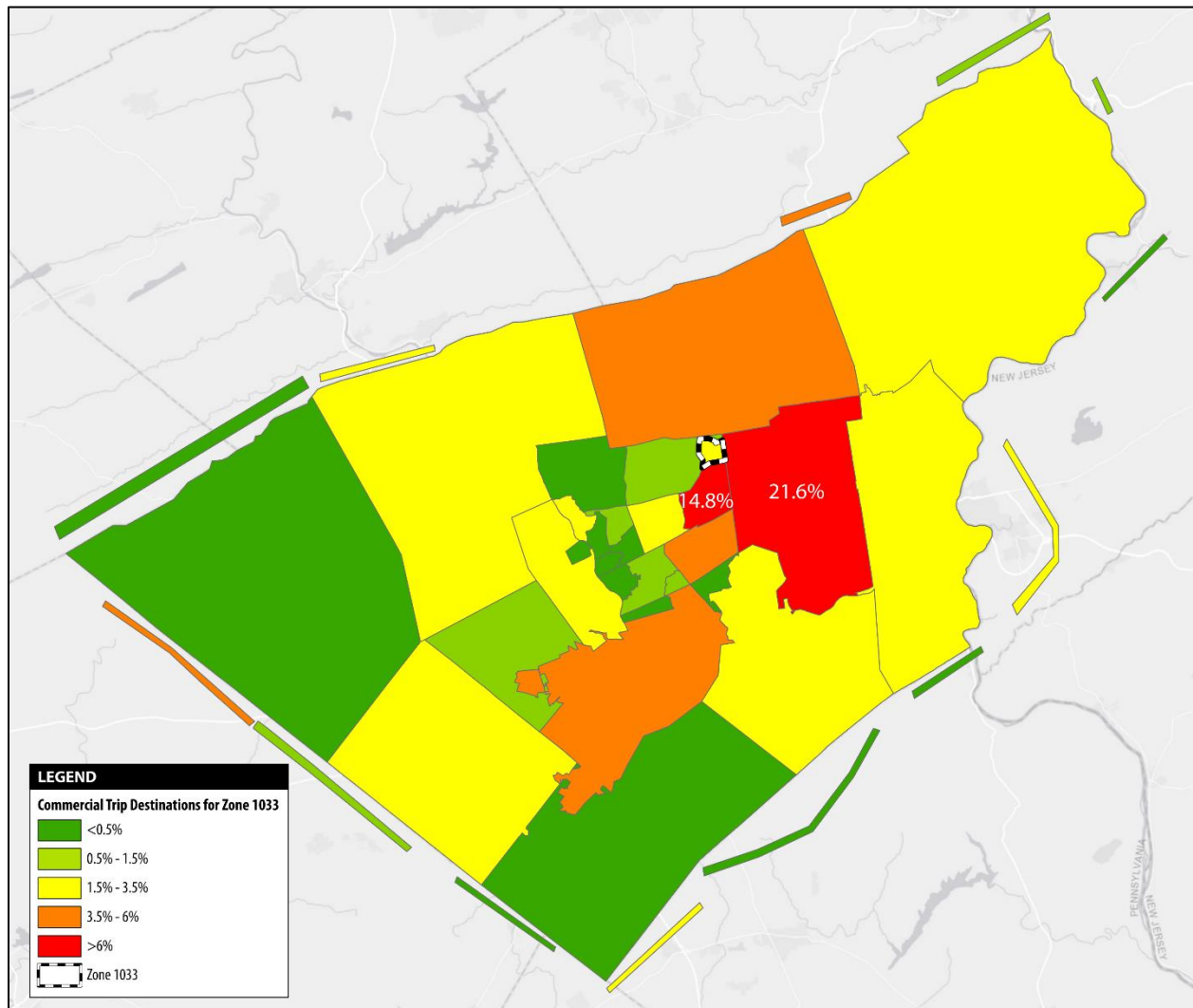
PA 329 (Howertown Road to Main Street)												
Day of Week	Eastbound						Westbound					
	Travel time index			Planning time index			Travel time index			Planning time index		
	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM
Monday	1.3	1.2	1.3	2.0	1.8	1.8	1.2	1.3	1.5	1.7	1.9	2.1
Tuesday	1.4	1.2	1.4	2.2	1.8	2.0	1.3	1.3	1.6	1.8	1.9	2.5
Wednesday	1.4	1.2	1.4	2.2	1.8	1.9	1.2	1.3	1.6	1.7	1.9	2.3
Thursday	1.4	1.3	1.4	1.9	1.8	1.8	1.3	1.3	1.7	1.8	1.8	2.6
Friday	1.4	1.3	1.4	2.0	1.8	1.9	1.3	1.3	1.9	1.8	1.9	3.1
Saturday	1.0	1.1	1.1	1.3	1.4	1.3	1.0	1.1	1.0	1.2	1.4	1.3
Sunday	1.0	1.0	1.0	1.2	1.3	1.2	1.0	1.1	1.0	1.1	1.2	1.3
Weekends	1.0	1.1	1.0	1.3	1.3	1.3	1.0	1.1	1.0	1.2	1.3	1.3
Weekdays	1.4	1.2	1.4	2.0	1.8	1.9	1.2	1.3	1.7	1.7	1.9	2.6
All Days	1.3	1.2	1.3	2.0	1.7	1.8	1.2	1.2	1.5	1.6	1.8	2.5

PA 248 (Maple Drive to Locust Drive)												
Day of Week	Eastbound						Westbound					
	Travel time index			Planning time index			Travel time index			Planning time index		
	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM

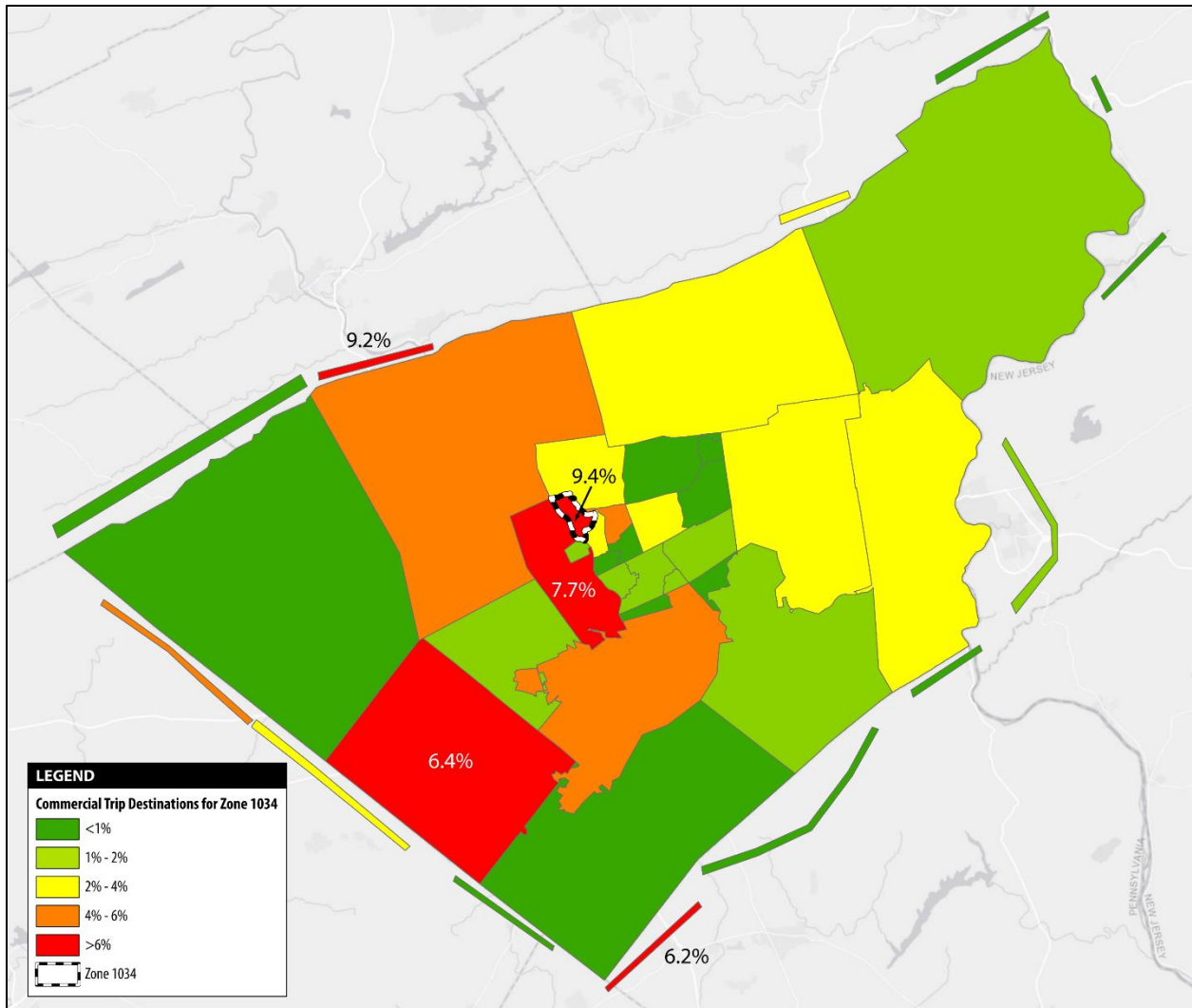
Monday		1.2	1.1	1.1	1.9	1.3	1.3		1.0	1.1	1.3	1.2	1.3	2.0
Tuesday		1.3	1.1	1.1	2.2	1.3	1.5		1.1	1.1	1.5	1.4	1.4	2.5
Wednesday		1.2	1.1	1.1	1.9	1.4	1.4		1.1	1.1	1.5	1.3	1.4	2.4
Thursday		1.2	1.1	1.1	2.0	1.4	1.5		1.1	1.1	1.5	1.4	1.5	2.3
Friday		1.2	1.1	1.1	1.7	1.3	1.4		1.1	1.1	1.5	1.4	1.4	2.2
Saturday		0.9	1.0	1.0	1.1	1.2	1.2		1.0	1.0	1.1	1.1	1.2	1.2
Sunday		1.0	1.0	1.0	1.1	1.2	1.2		1.0	1.0	1.0	1.0	1.2	1.2
Weekends		1.0	1.0	1.0	1.1	1.2	1.2		1.0	1.0	1.0	1.1	1.2	1.2
Weekdays		1.2	1.1	1.1	2.0	1.3	1.4		1.1	1.1	1.5	1.3	1.4	2.4
All Days		1.2	1.1	1.1	1.9	1.3	1.4		1.0	1.1	1.3	1.3	1.4	2.2

### Appendix B: StreetLight Data Commercial Interchanges by Study Area Zone

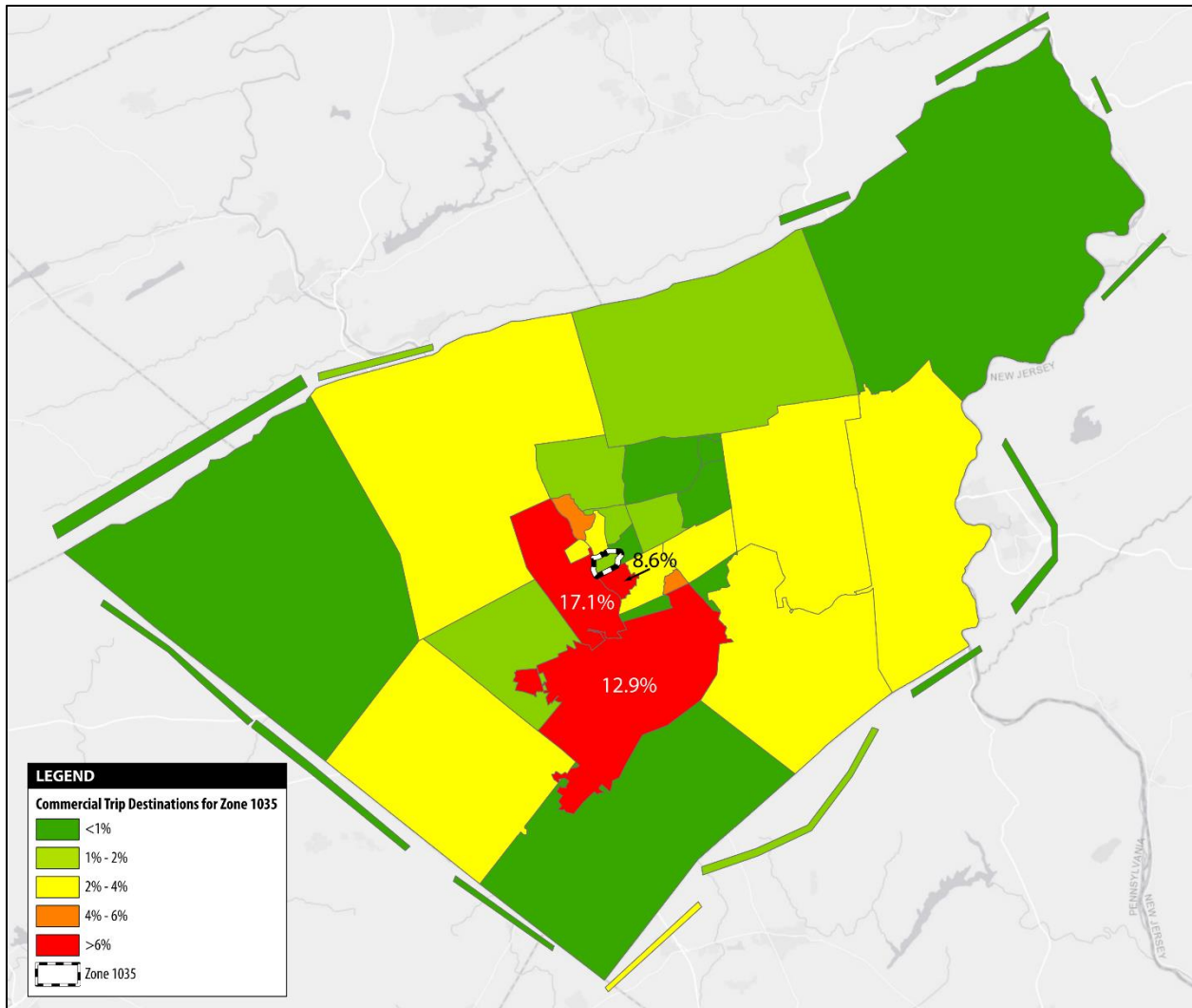
#### Zone 1033



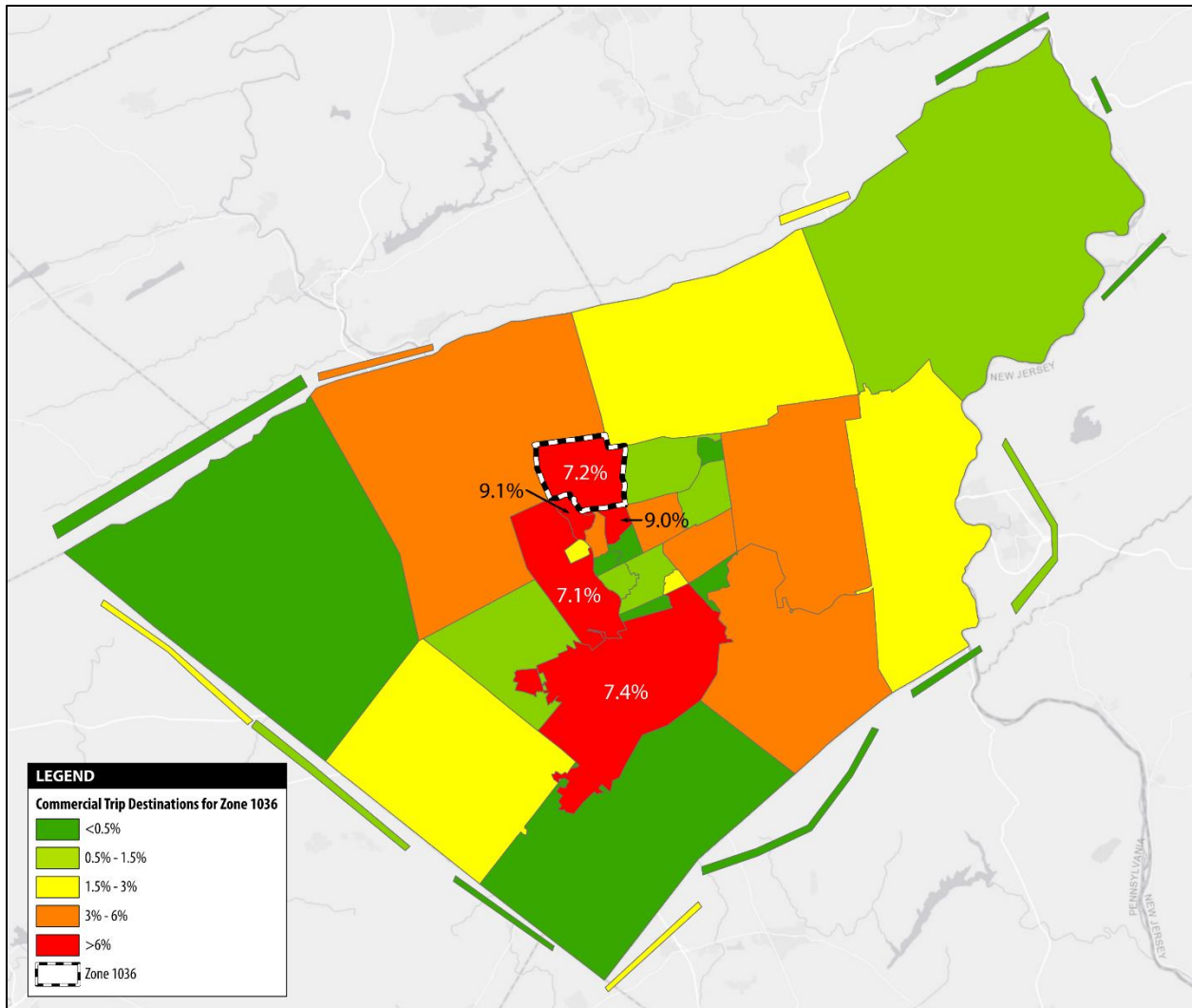
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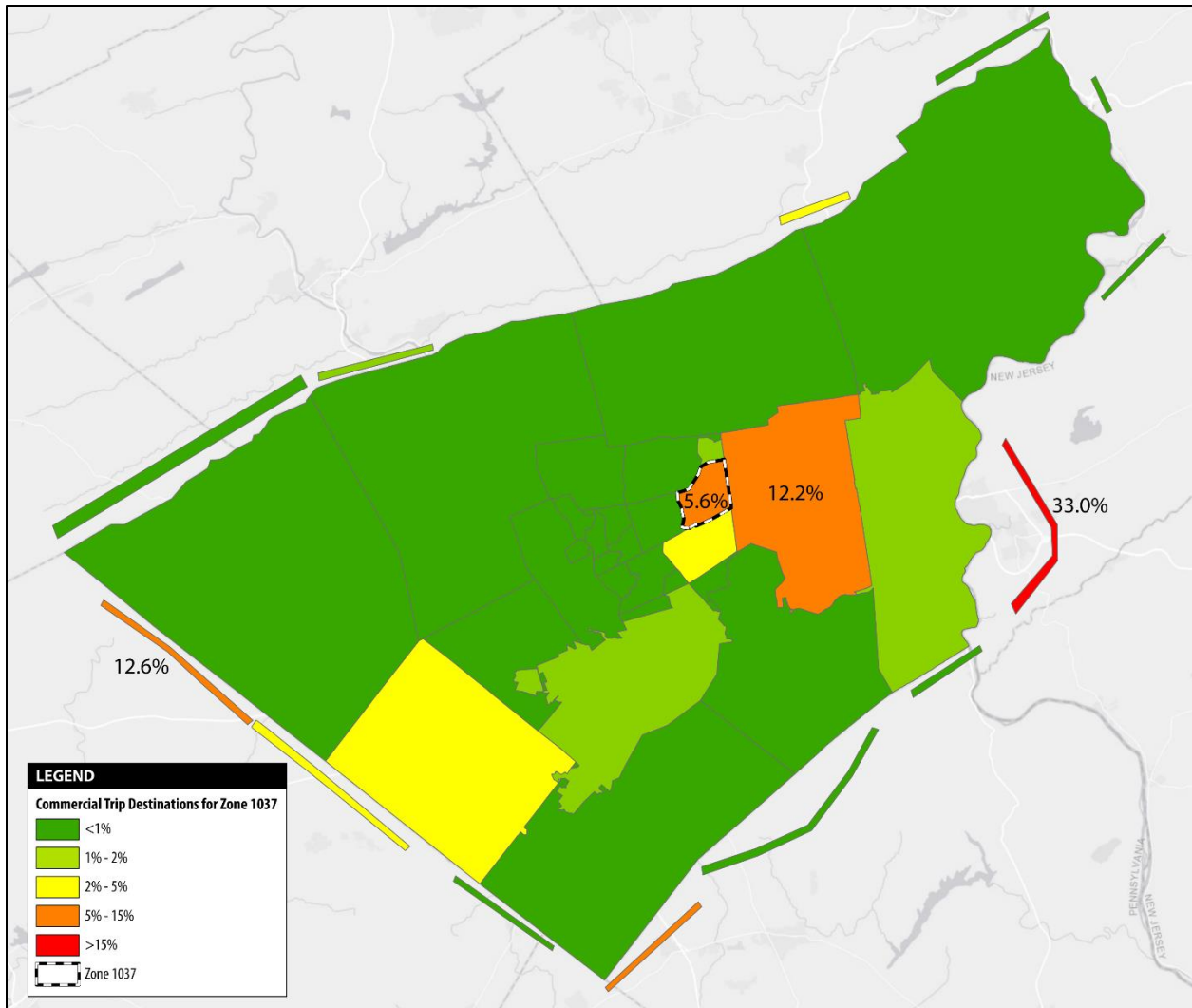
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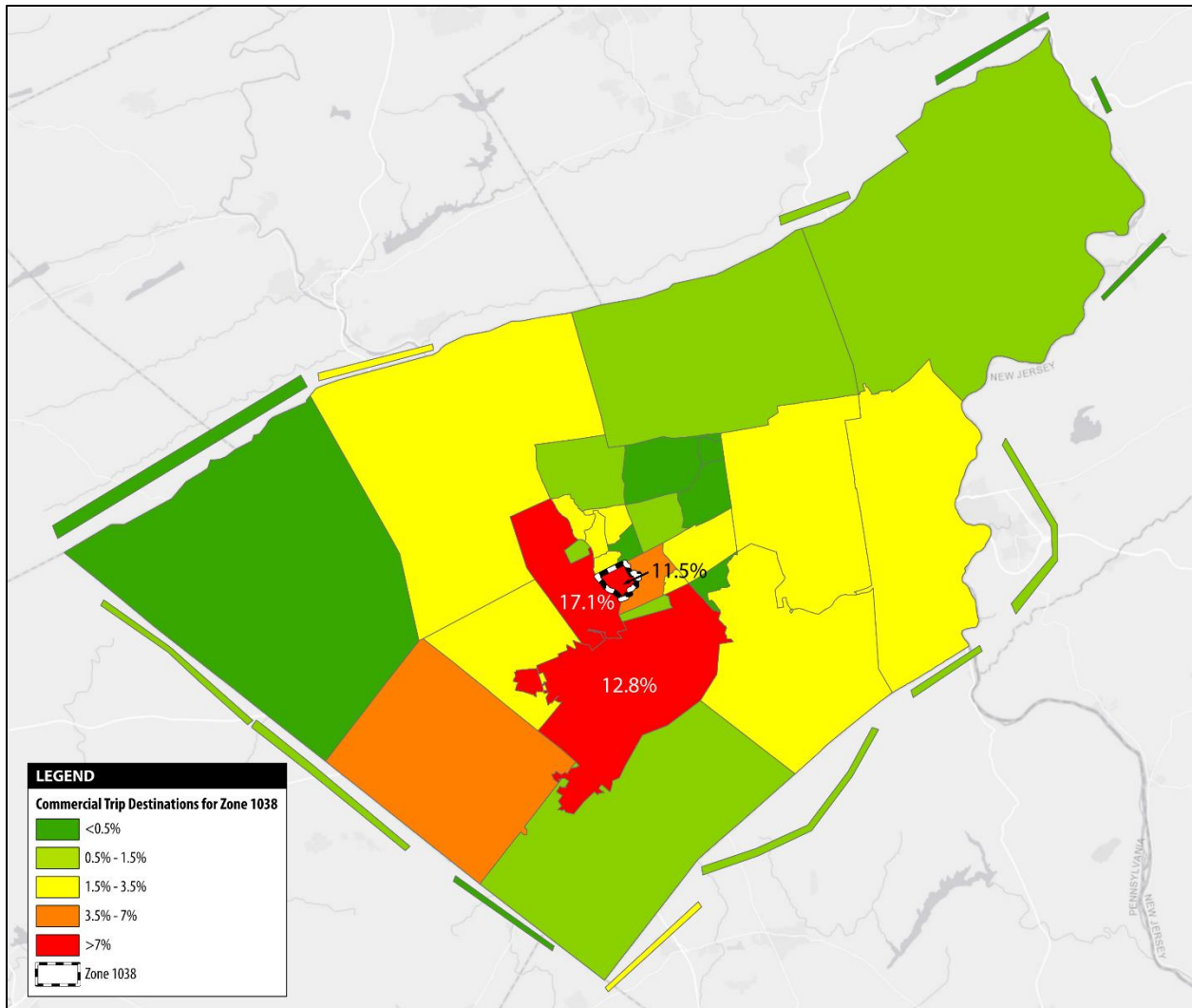
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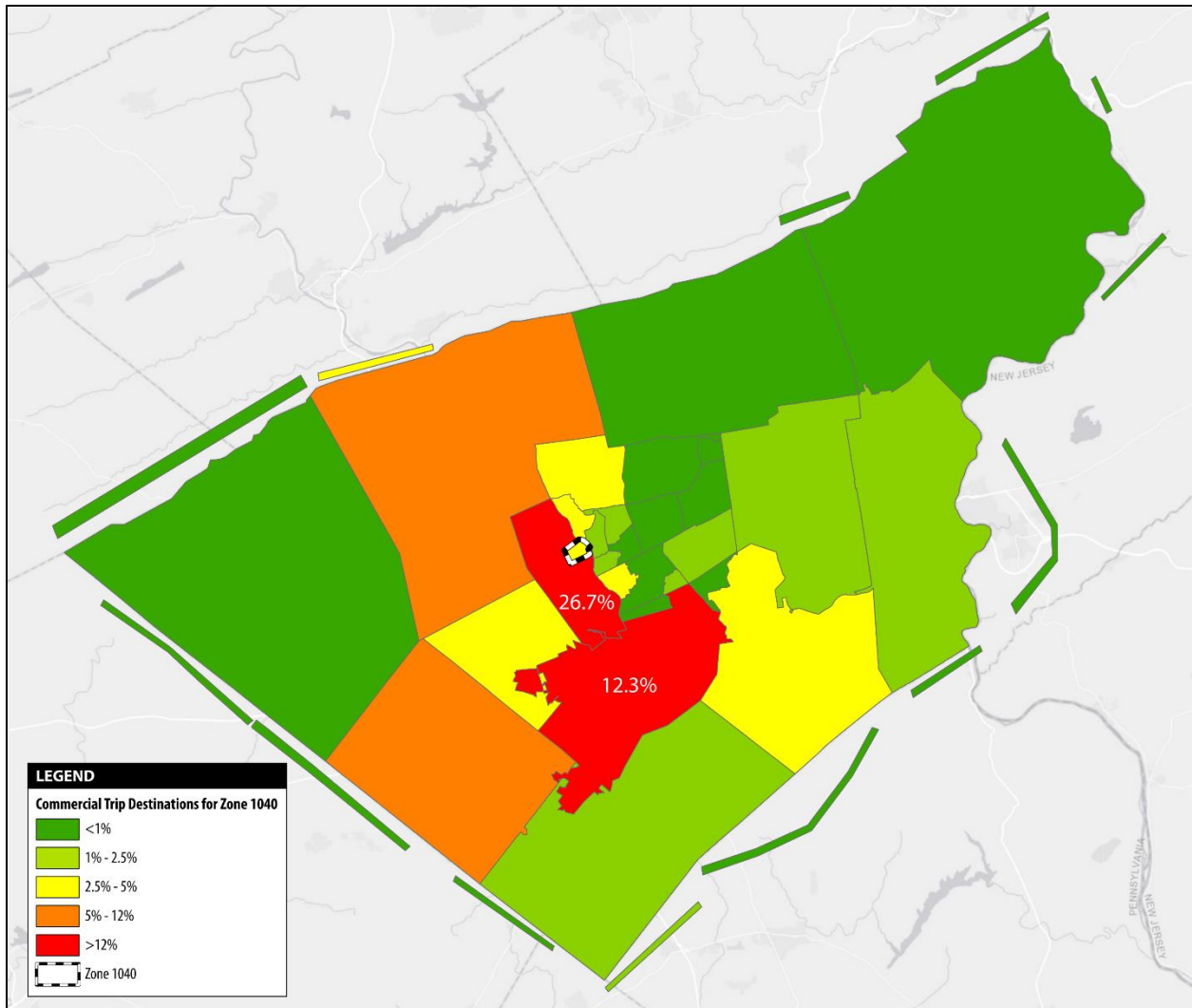
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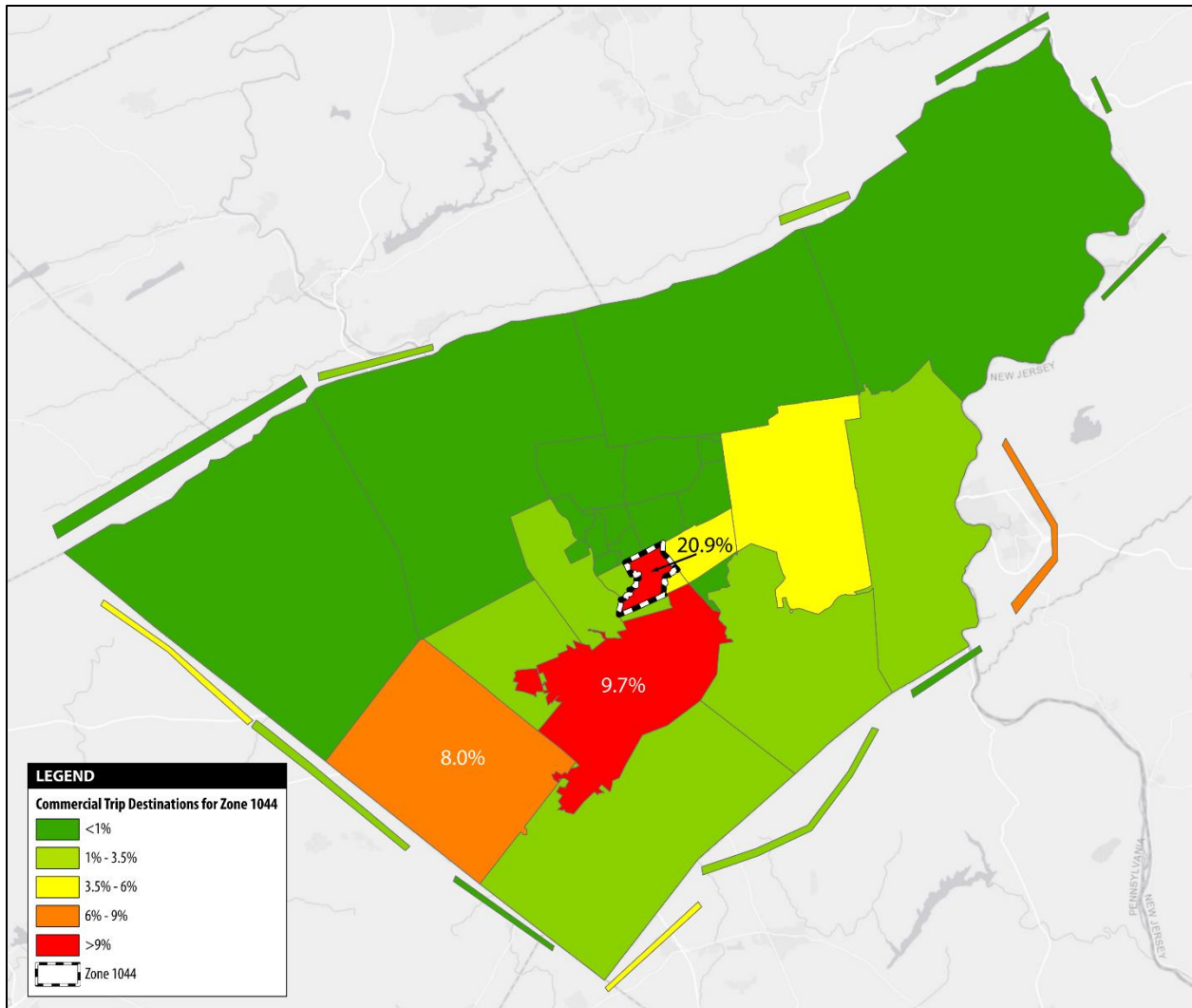
## Zone 1038



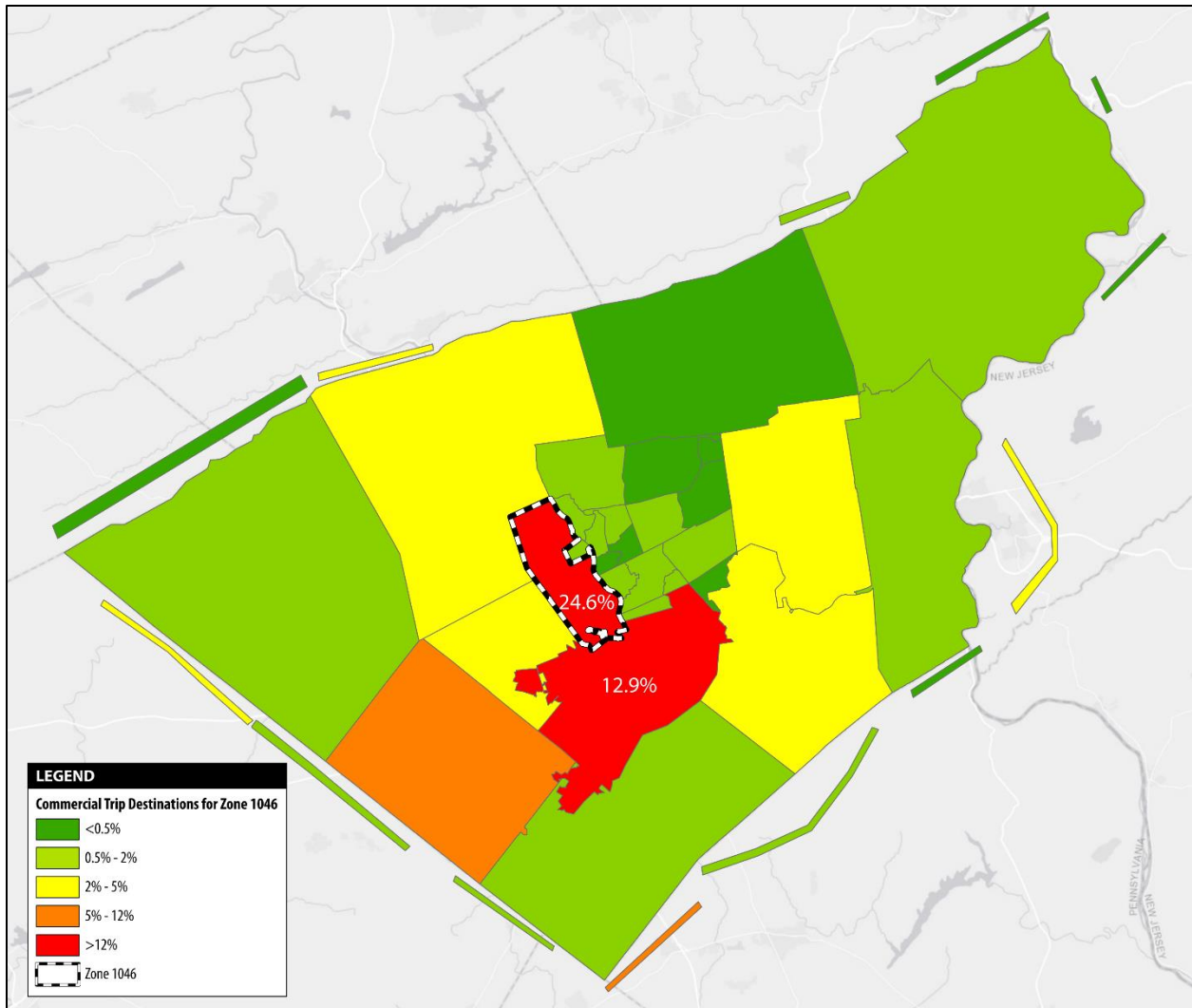
### Zone 1040



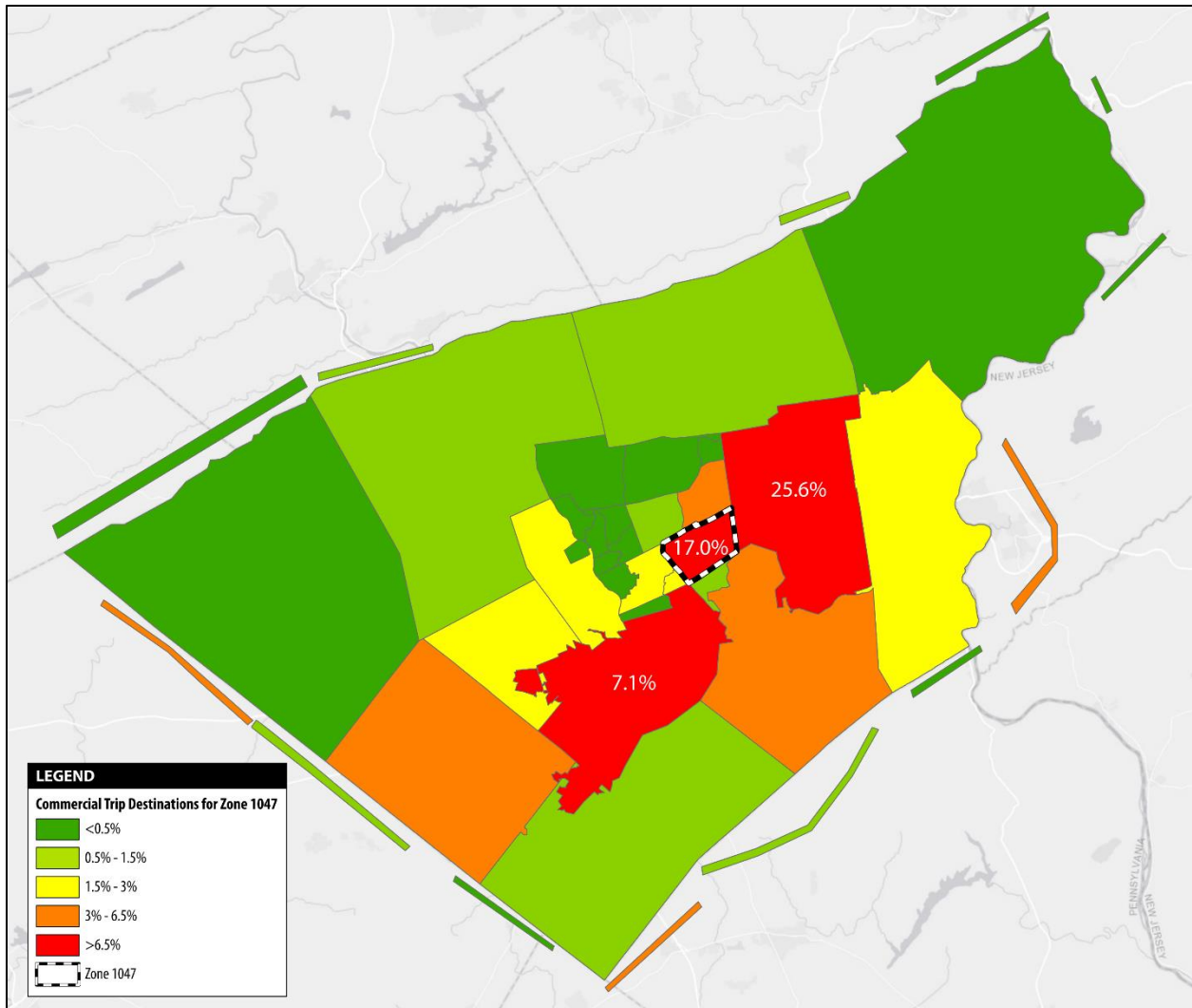
## Zone 1044



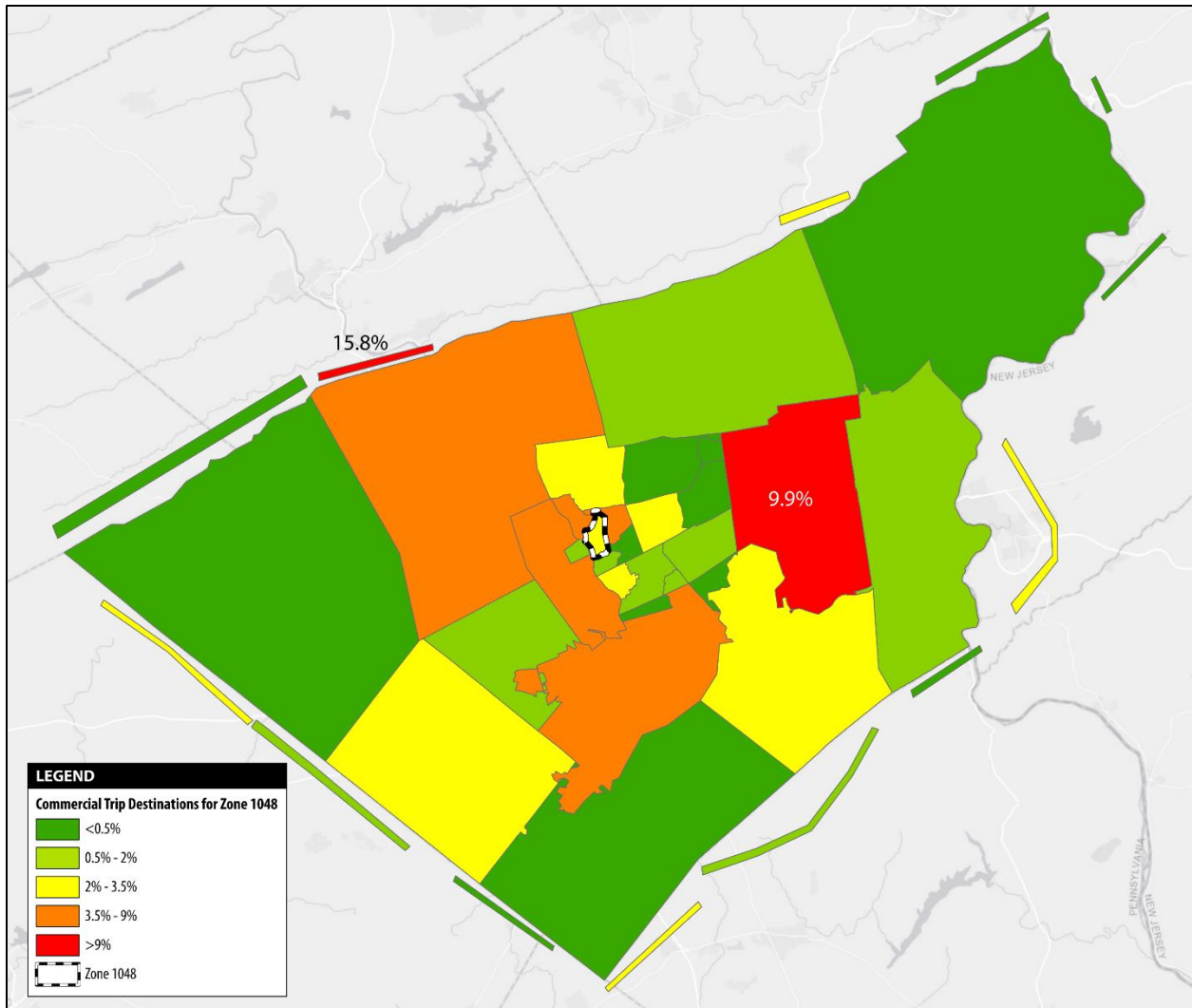
### Zone 1046



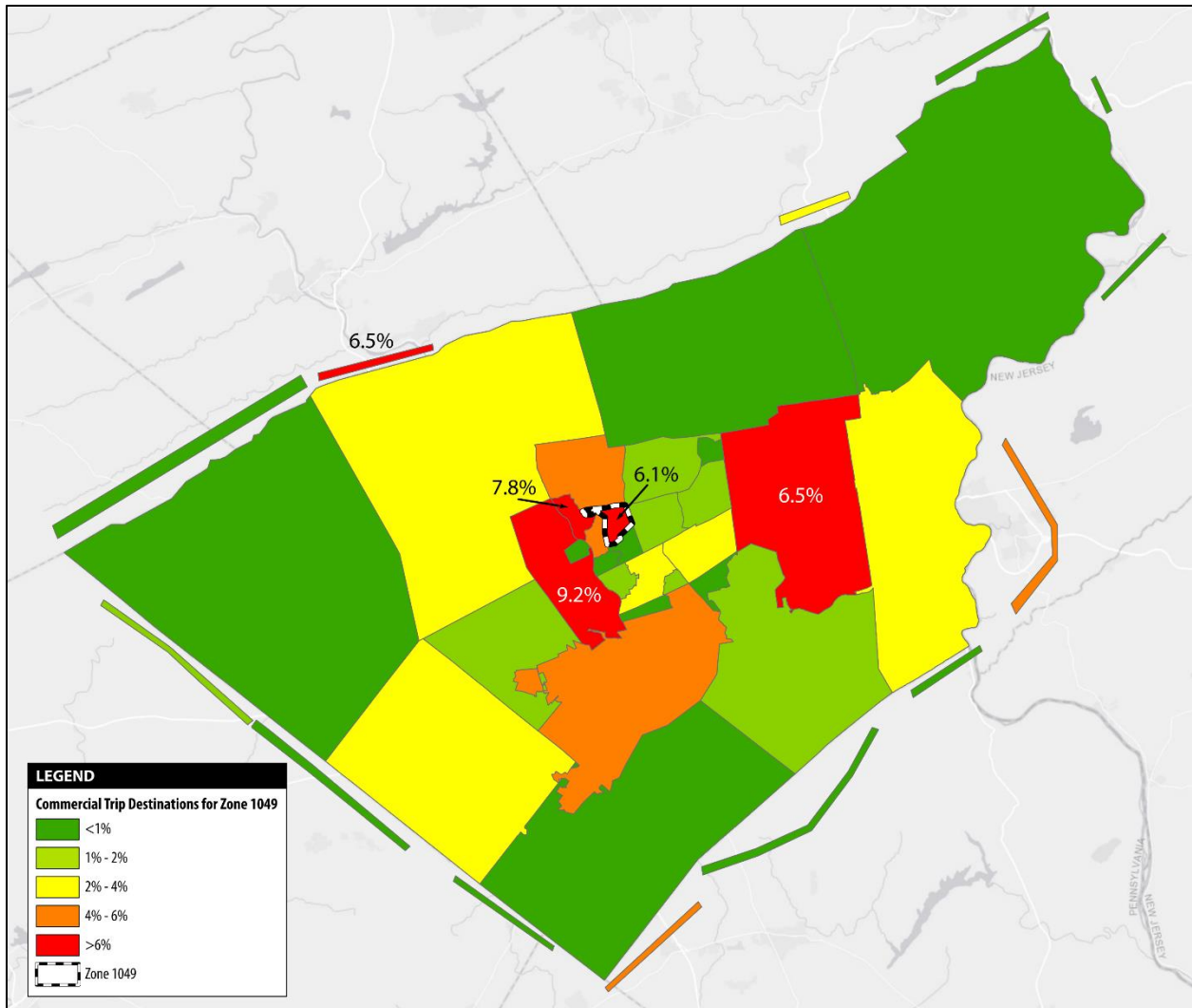
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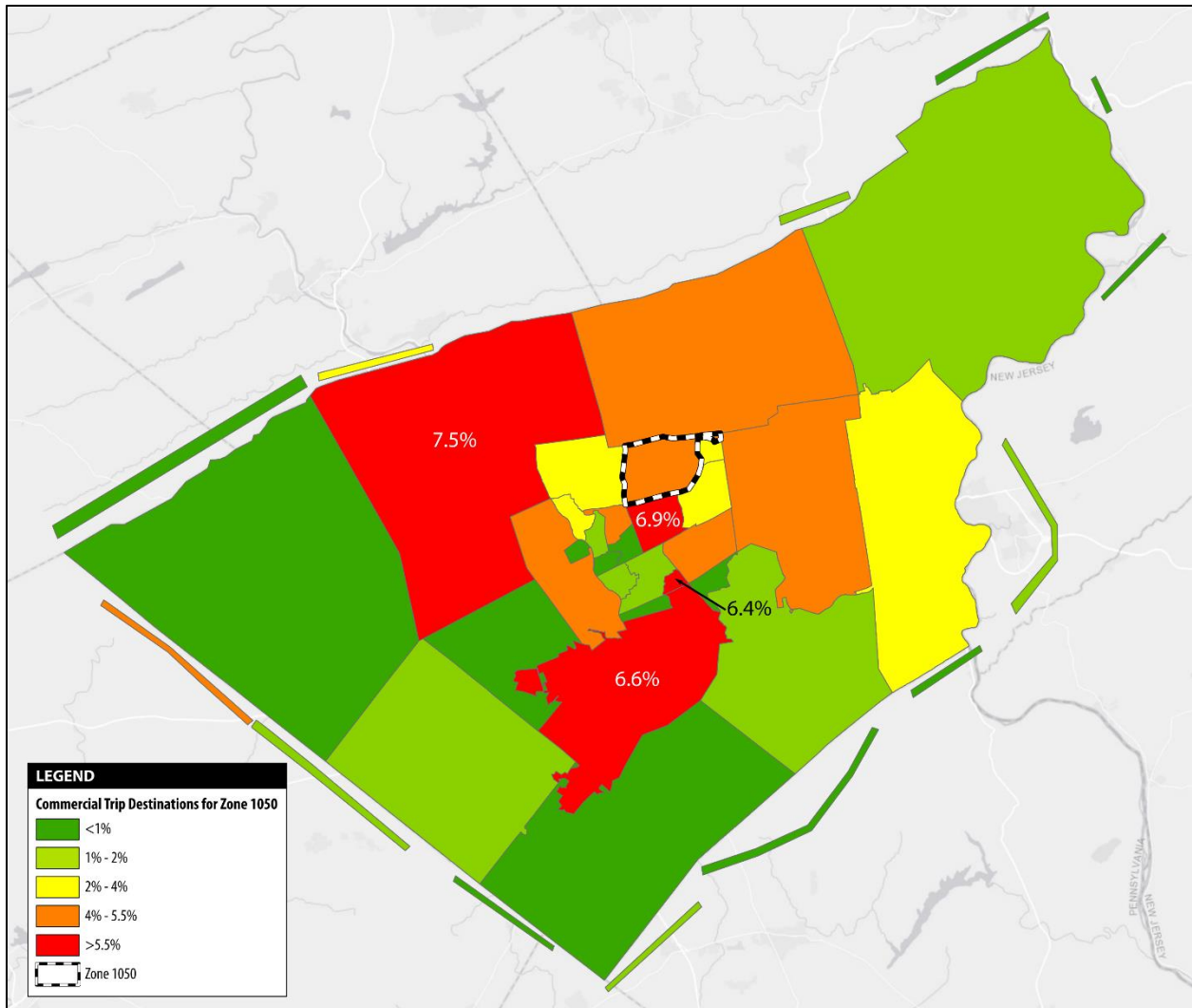
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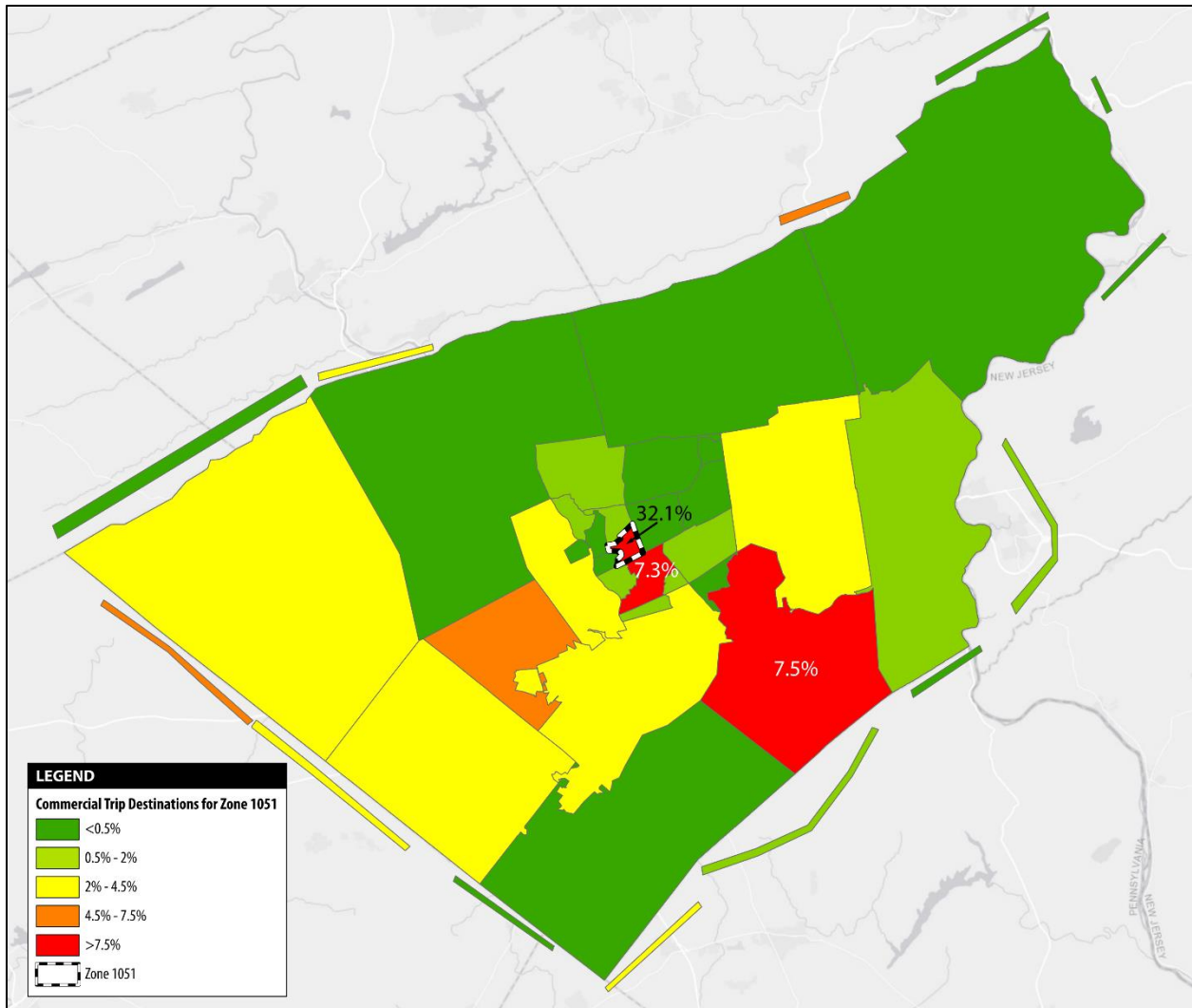
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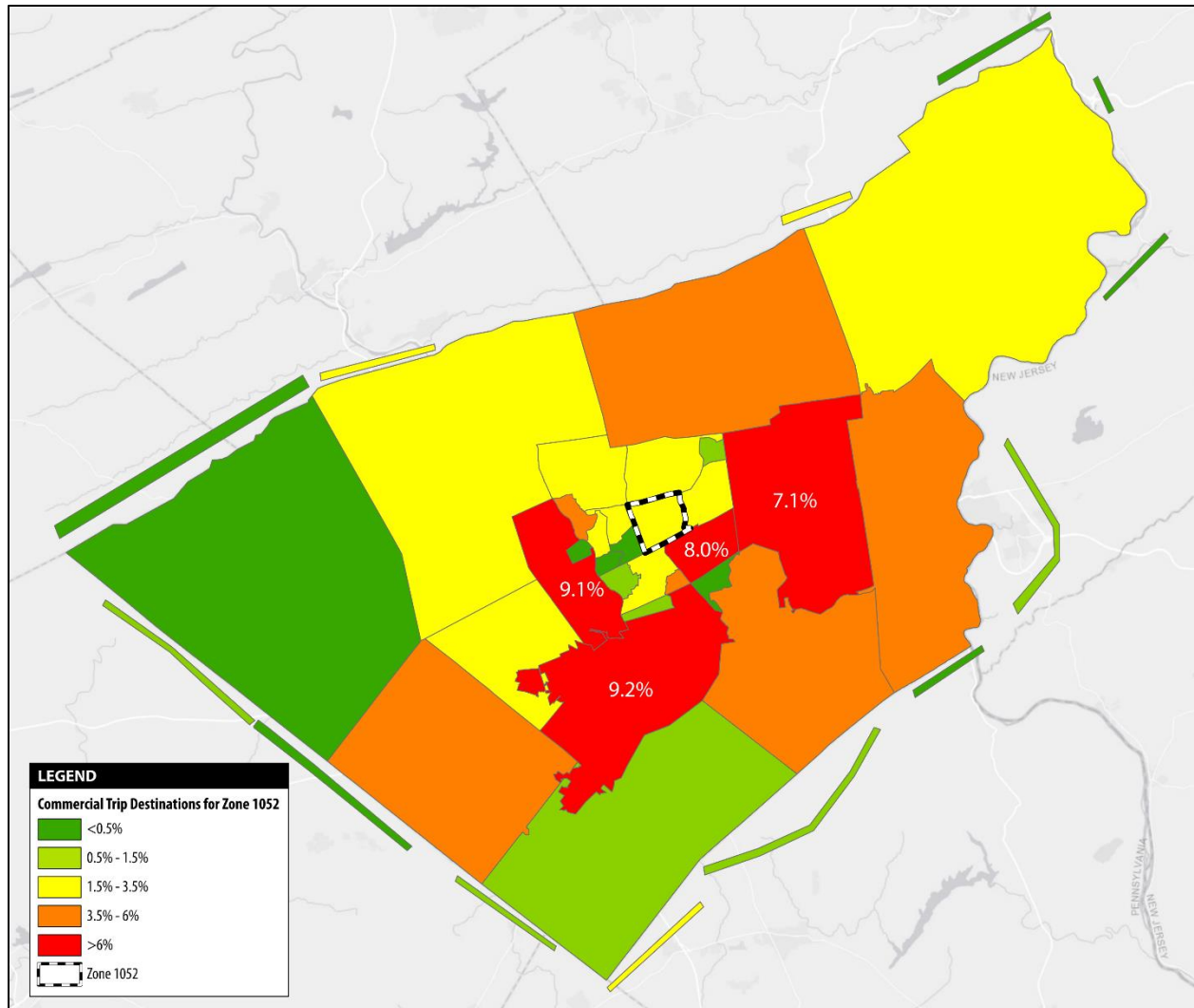
### Zone 1050



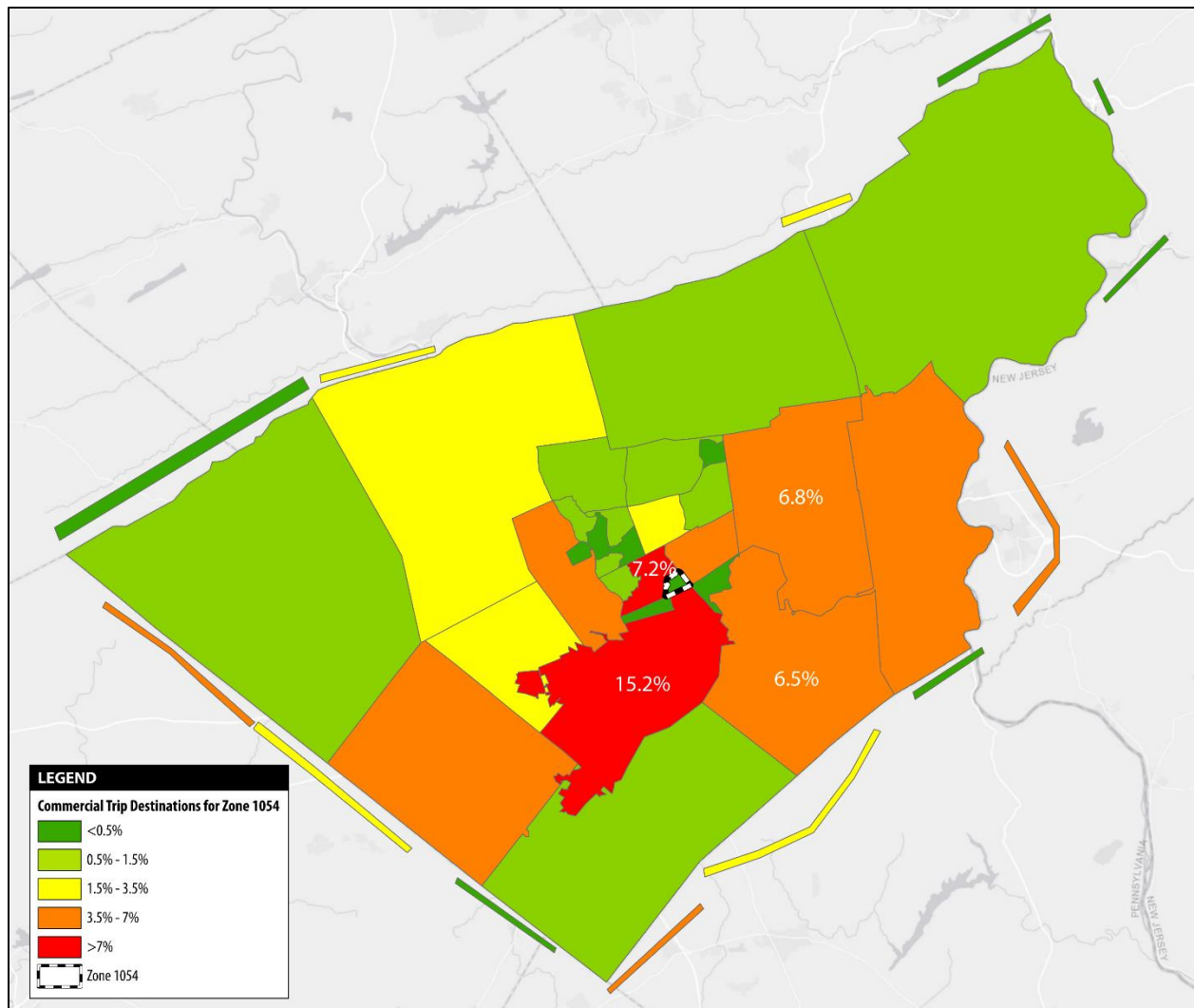
## Zone 1051



### Zone 1052



## Zone 1054



### Appendix C: LANTA Fixed Routes Operating in the Study Area

- **Route 103 South Bethlehem – Northampton:** Provides service to Downtown Allentown, South Bethlehem, Lehigh Valley Industrial Park (LVIP) VII, Fountain Hill, Mountainville Shopping Center, Lehigh Valley Mall, Whitehall Mall, Catasauqua, North Catasauqua, Northampton, and Cherry Square. Operates seven days per week.
- **Route 104 Emmaus – Lehigh Valley Mall:** Provides service to Emmaus, South Mall, Good Shepherd Hospital, Downtown Allentown, and Lehigh Valley Mall.
- **Route 105 LV Mall – South Bethlehem/Hellertown:** Provides service to Lehigh Valley Mall, Westgate Mall, Bethlehem, Lehigh University, Sands Casino, Commerce Center Boulevard, and Hellertown. Most of the portion of this route within the study area is express along US 22 without stops. Operates seven days per week.
- **Route 211 Lehigh Valley Hospital – Presidential Village:** Provides service to Lehigh Valley Hospital, Cedar Crest Professional Park, Downtown Allentown, Lehigh Valley Mall, Whitehall Mall, Whitehall Square, Presidential Village, Olympic Gardens, Spring Ridge Apartments, and Overlook Road.
- **Route 215 Hellertown – Lehigh Valley Airport/Lehigh Valley Industrial Park I:** Provides service to Hellertown, Bethlehem, Westgate Mall, LVIP 1, LVIP II, LVIP III, LVIP VII, Lehigh Valley International Airport, Macron Blvd, and Postal Road. Operates Monday through Saturday.
- **Route 319 Lehigh Valley Mall – Bethlehem Square via Lehigh Valley Airport:** Lehigh Valley Mall, Catasauqua, LVIP I, LVIP II, LVIP IV, Lehigh Valley International Airport, Brodhead Road, and Bethlehem Square. Operates Monday through Friday.
- **Route 324 Allentown – Lehigh Valley Airport:** Provides service to Downtown Allentown, Downs Drive, PennDOT, LVIP I, LVIP III, and Lehigh Valley International Airport.
- **Route 325 Lehigh Valley Mall – Walnutport:** Provides service to Lehigh Valley Mall, Whitehall Mall, Whitehall Shopping Center, Hokendauqua, Coplay, LCCC-Schnecksville, Neffs, Slatington, and Walnutport.
- **Route 602 MacArthur Road WhirlyBird:** Provides service to Lehigh Valley Mall, Whitehall Mall, Whitehall Shopping Center, MacArthur Towne Center, and Whitehall Square.
- **Route 603 Lehigh Valley Mall – Parkway Shopping Center:** Provides service to Lehigh Valley Mall, Gross Towers, B’nai B’rith, Lehigh Valley Hospital-17<sup>th</sup> Street, William Allen High School, St. Luke’s Hospital, Episcopal House, YMCA/YWCA, and Parkway Shopping Center.

**Table 9: Bus Trips by LANTA Route within the Study Area**

Route Number	Weekday # of Trips	Saturday # of Trips	Sunday # of Trips	Total Weekly Trips	Weekday First Trip	Weekday Last Trip	Weekday Span of Service	Weekday Peak	Weekday Midday	Weekday After 6:30pm
Route 103	44	34	20	98	5:40 AM	10:45 PM	17:05	X	X	X
Route 104	47	32	18	97	5:29 AM	10:48 PM	17:19	X	X	X
Route 105	30	29	16	75	7:30 AM	9:44 PM	14:14	X	X	X
Route 211	30	30	0	60	5:46 AM	8:10 PM	14:24	X	X	X
Route 215	24	24	0	48	6:30 AM	5:25 PM	10:55	X	X	
Route 319	18	0	0	18	6:27 AM	6:07 PM	11:40	X	X	
Route 324	7	0	0	7	6:34 AM	5:51 PM	11:17	X	X	
Route 325	10	0	0	10	7:00 AM	7:16 PM	12:16	X	X	
Route 602	30	30	17	77	6:25 AM	9:40 PM	15:15	X	X	X
Route 603	20	16	0	36	6:45 AM	7:00 PM	12:15	X	X	

*Source: Lehigh and Northampton Transportation Authority, Department of Planning (May 2017)*

### Appendix D: Study-Area Truck-Generating Parcels Evaluated against Proposed Truck Network

#### LEHIGH COUNTY

##### Catasauqua Borough

Catasauqua Borough is located west of LVIA and does not include any designated truck routes. The Borough permits trucking and other freight-related uses in its Industrial Office (IO) and Airport (A) zoning districts. Land behind residential lots, currently ball fields along Race Street heading west into the Borough of Catasauqua, allows trucking-related uses by Special Exception. This area of the Borough is located less than a half-mile from the intersection of Race Street and Willow Brook Road. Also, in this same region, there are parcels in the Airport zoning district that allow trucking-related uses. Current zoning is **considered inconsistent** with the proposed designated truck corridors; however, this land could be considered as future lands for trucking-oriented uses.

##### Coplay Borough

Coplay Borough is located north of LVIA and does not contain any recommended truck routes. Coplay Borough is a densely developed community with a mix of residential uses and parklands. Moreover, the borough does not have any zoning districts that permit trucking-related uses.

##### Hanover Township

Hanover Township (Lehigh County) is the host municipality to LVIA. The township contains three designated truck route corridors: US 22, Race Street, and Willow Brook Road. Hanover Township permits trucking and other freight-related uses across several zoning districts, including: Planned Commercial (PC), Planned Industrial Office (PIO), Airport-Industrial (AI), and Planned Unit Development (PUD). Most of the airport properties are in Hanover Township (Lehigh County). Existing industrial development does exist or is planned for the properties directly on or stemming off recommended truck corridors in the study area. Local zoning allows trucking-related uses on a vacant property along Race Street a quarter-mile west of Willow Brook Road. The intersection of Willow Brook Road and E. Race Street is a designated truck route corridor. Currently the zoning for this parcel is considered **inconsistent** with the proposed truck corridor route; however, this land could be considered for future trucking-oriented uses.

##### North Whitehall Township

North Whitehall Township is located northwest of LVIA and contains one proposed truck corridor, PA 145. The township is predominately rural residential and agricultural, with several densely populated villages throughout the township. Land uses along PA 145 are agricultural and include lands identified for future conservation. Currently, trucks travel to the southeastern portion of the township to industrial and quarry operations within the Mineral Extraction General Industrial (ME-I) zoning district.

##### Whitehall Township

Whitehall Township is located west of LVIA and has three recommended truck routes: PA 329, US 22, and PA 145 (MacArthur Road). The township has one primary zoning district that allows trucking-related businesses just off the MacArthur Road and E. Columbia Street intersection. There are a variety of existing industrial uses in industrial zoning districts having no direct access to MacArthur Road as

designated truck corridor. There are agricultural, commercial, and residential lands that lie between the Industrial zone and MacArthur Road. The properties between the corridor and the Industrial zones may experience growth pressures from surrounding industrial and commercial land uses.

## **NORTHAMPTON COUNTY**

### **Allen Township**

Allen Township is located north of LVIA and contains two recommended truck corridors, PA 329 (Nor Bath Blvd) and Willow Brook Road. Zoning in Allen Township promotes industrial development (I/C and I Districts) in the central and southern portions of the township. Industrial Districts I/C and I allow trucking and freight-related uses by right. The I/C District location is consistent with the proposed truck corridor on PA 329. There is an existing trucking-related use located in an Industrial (I) District along Savage Road. A large tract on Willow Brook Road in the southernmost portion of the township, currently zoned Industrial, is consistent with the proposed designated truck route corridor.

### **Bath Borough**

Bath Borough is located northeast of LVIA and contains three recommended truck routes: PA 987, PA 512, and PA 248 (East Northampton Street). There are two zoning districts (Manufacturing/ Commercial (M-C & M-C2)) that allow trucking- and freight-related uses. One MC district of approximately 35-40 acres is located on the north side of W. Main Street. It is currently vacant and **is not consistent** with the study's proposed truck route network.

### **East Allen Township**

East Allen Township is located northeast of LVIA and contains four recommended truck routes: PA 329, Airport Road, PA 512, and Weaversville Road. The Township permits trucking-related uses in two zoning districts, Light Industrial/Business Park (LI/BG) District and General Industrial (I) District, by Conditional Use. The two industrial zoning districts encompass several properties throughout the southern half of the township, each of which are located on or near recommended truck route corridors.

### **Hanover Township**

Hanover Township (Northampton County) is located southeast of LVIA. Four recommended truck route corridors have been identified in the township: PA 987, Schoenersville Road, US 22, and PA 512. The township permits trucking-related uses in its Planned Industrial/Business District (PIBD). Truck parking is supported as a conditional use and warehousing is permitted as an accessory use in the Planned Office, Research and Residential District (PORR) District. The PIBD and PORR Districts are located within recommended trucking corridors. All other commercial districts specifically prohibit trucking-related uses.

### **Lehigh Township**

Lehigh Township is located north of LVIA and does not contain any recommended truck corridors. Zoning provisions in Lehigh Township allow, by special exception, trucking and freight-related uses in the Industrial (I) zone located in the westernmost portion of the township along Riverview Drive. The Industrial zoning district also features available rail transportation. The Township also permits warehouse uses by right in the General Commercial (GC) District. The GC and I zoning districts in the Township are located close to the project study area but are a considerable distance from any

recommended truck route. This could be considered **inconsistent** with the network of designated truck route corridors.

### **Moore Township**

Moore Township, Northampton County is located on the northern-most portion of the study area. There are no proposed truck route corridors identified in the township. Within the township's portion of the study area, land uses are predominately agricultural and low-density residential. There are no zoning districts located within the study area that permit trucking-related uses.

### **Northampton Borough**

Northampton Borough, located northwest of LVIA, does not contain any recommended truck routes. The borough contains two zoning districts, I-1 and I-2, that permit trucking and freight-related uses by Special Exception. All industrial zones in the borough are built-out or nearly built-out with a variety of pre-existing industrial uses.

### **North Catasauqua Borough**

North Catasauqua Borough is located northwest of LVIA and does not contain any recommended truck routes. A Multi-Purpose (M1) zoning district in the Borough permits trucking-related uses along the Lehigh River along with regional freight rail lines. However, existing industrial uses do not rely on rail freight service for business operations. Although this land area is very small, it is not a favorable location for future trucking-related uses since all trucks must use borough streets with smaller turning radii. Local zoning **is not consistent** with the proposed truck route network.

## Appendix E: Stakeholder Roundtable Meeting Summaries

The stakeholder roundtables were guided by a series of questions aimed at maximizing stakeholder engagement:

- What major trends and issues have you observed with respect to freight activity and its impacts in the study area?
- Where is there anticipated growth or land development pressure for freight-generating activities in the study area?
- Where are existing major freight bottlenecks located?
- Are there any administrative or institutional issues that are barriers to planning for freight movement?
- What, if any, land use management strategies are needed to lessen the current impacts of freight and address future concerns?
- Are there any transportation-specific capital improvements (e.g., improved intersection geometry, passing lanes, etc.) that should be considered in the LVIA Freight Study?

<b>Date</b>	June 18, 2018
<b>Time</b>	5:30 PM
<b>Location</b>	LVPC, 961 Marcon Blvd. #310, Allentown, PA 18109
<b>Meeting Name</b>	LVIA Area Freight Study: Municipal Stakeholder Roundtable

**Meeting Purpose:** Offer municipal stakeholders the opportunity to provide input on local freight trends, anticipated land developments, existing freight bottlenecks, and capital improvements needed to address freight impacts.

### Summary of Stakeholder Input

#### ***What are some of the observed trends and issues related to freight within your municipality?***

- a. Over the past 10 years, there has been an increase in tri-axle trucks on the study area road network due to mineral extraction activity. The trucks are bringing in dirt from New York and New Jersey, with a large number traveling on PA 329 and PA 248. The trucks traveling on PA 248 tend to head north into Carbon County or to Coplay across the river.
  - i. The braking of heavy trucks is creating a washboard effect at certain intersections. The current road network wasn't built to handle such heavy trucks.
- b. There is a dramatic increase in truck traffic and it is resulting in truck parking issues. There have been instances of trucks parking in the center of roadways and along the shoulder near distribution centers. Because there are no truck stops in the study area, there are few options. In Lower Nazareth, there are semi-permanent parking areas

- (e.g., a truck driver can stop in a rest area with a larger parking lot), but not every municipality has such facilities available.
- c. Walmart prohibits truck parking. The Carmike Cinema (AMC Theater) has had issues with trucks parking in their lot and now they have prohibitive signs posted, with state police enforcement.
  - d. There is a need for increased enforcement with respect to truck parking. However, enforcing truck parking restrictions would consume a lot of police time. Three of the municipalities within the study area rely on state police. The penalty for a truck driver exceeding their hours of service is greater than parking fines.
  - e. Some of the new warehouses and distribution centers are including spaces for truck parking.
  - f. Municipalities need to consider the environmental impacts of truck parking. When trucks idle, it creates air quality concerns.
  - g. Some municipalities require roads to be built to a higher standard for trucks. For example, a road could have “full depth reclamation” (8” – 16”). Heavy trucks wear on the road and unless roads are required to be built to a higher specification, there will be more expensive and long-term maintenance on municipally-owned roads.
  - h. As of April 1, 2018, the truck driver hours of service regulations are being enforced by the state police and PennDOT. Every truck driver may work only 14 hours and then must take 10 hours off. Within the first 8 hours, the driver must take a 30-minute break (truck turned off, no wheels can turn). Some drivers run out of time and warehouses won’t allow them to stay. Drivers have to find the first safe haven to shut down and take their required 30-minute break.
    - i. Upper Macungie Township is trying to address this by recommending 10 to 12 truck parking spots for any industrial development. They are also looking at including driver facilities (e.g., bathrooms, showers, etc.).
  - i. As far as tri-axle trucks on PA 329, PennDOT issues a \$25 permit to cross the bridge over the Lehigh River. Dump trucks are a lot heavier and they will wear roadways more (more weight on fewer axles).
  - j. There is signage at one of the warehouses that directs truckers to turn right to deter their GPS units from sending the trucks into a residential area. Once a truck turns, they are committed and can’t turn around easily. Paper maps are still the best option for truck drivers.
  - k. Improvements to the road system have been very slow. With the FedEx development, it was thought that the improvements on US 22 would be completed by now. The bridge work won’t begin until next year.
  - l. In the northeast portion of the study area, there are three cement plants. All of the plants are working deeper and deeper into limited reserves. To continue operation,

the companies will need to supplement the lesser-grade material with higher-grade material that is imported. This area may see an uptick in hauling shipments if there is an increased building cycle. Nearly all of the truck traffic in the cement-hauling industry is heavily regulated, so there shouldn't be an issue with those trucks seeking alternative routes.

- i. The cement industry has dedicated company drivers. Their routes are prescribed. FedEx has the opposite practice. They do not have a company driver; all of their drivers are contracted/independent. It is more difficult to manage those routes.
- m. There needs to be a push to get developers to contribute to signalized intersections. PA 329 has had upgrades.
- n. One opportunity for diverting traffic away from Bath Borough is a bypass to PA 248; Bath Borough has a five-point intersection.
- o. The biggest impact is on municipally-owned roads that aren't maintained by PennDOT, especially when a distribution center is built in a neighboring community.
- p. On March 2, 2018, there was a massive snowstorm and many trucks were taking back routes because the main roads were closed. There is a lack of network redundancy to handle these issues.
- q. The ongoing backup on US 22 makes it difficult for truckers to get onto the highway at peak hour. Airport Road is also gridlocked, without the FedEx facility open.
- r. It would be ideal to cluster warehouse and distribution center development to take pressure off municipalities to the north. The approach would have to be very regionally-coordinated.
  - i. This may not be an easy fix; if you cluster industrial development, all of the tax revenue would be generated in that municipality. Other municipalities would lose out.

***What are some of the observed trends and issues related to freight within your municipality?***

- a. If there is a multi-municipal comprehensive plan that includes 8 to 10 municipalities, they won't recommend warehousing/commercial for municipalities that don't have sewer service.
- b. Lower Nazareth is working with 10 municipalities on a joint comprehensive plan. At the end of the scoping process, East Allen Township decided not to participate.
- c. The farther away from US 22, the more independent the municipalities tend to be.
- d. When developers are looking at their options, they see the peripheral municipalities as inexpensive land. Farmers who want to retire view their land as retirement income.

- e. Whitehall Township zoned an area industrial and they wanted to down-zone it because the land use didn't align with the zoning. They immediately received letters from attorneys representing land owners because the down zone would represent a "taking."

***Looking at major parcels within study area, are there any that could turn over in the next 20 years that the study needs to address?***

- a. Airport Road/Chambers Road – there is a land lease in place (Majestic Realty)
- b. There are a few housing developments near Airport Road off of PA 512.
- c. Developers are interested in constructing more housing for individuals age 55 and older. What happens to these developments over the next 20 years as boomers pass on and there aren't enough older individuals to occupy that specific housing type?
- d. Weaversville Road isn't accessible to some trucks. There is a new law in effect (SB 880) and it opens up access for 102" wide vehicles. Any bridge that was previously marked as prohibited for size/weight will remain prohibited. Municipalities must petition to restrict the size and weight of vehicles and if it is a state highway, the municipality must register and apply through PennDOT. An engineering study must be completed to prove the truck should not be on the road. When a municipality seeks to implement these restrictions, they must have a replacement path [alternative route]. Some municipalities have no replacement path.
- e. There is a current rezoning request for light industry for a property in East Allen Township.
- f. There are significant mineral extraction activities in and around the study area and regulating heavy trucks is a challenge. DEP has relaxed its definition of "reclamation fill"; quarries that aren't being filled aren't being regulated as closely. East Allen Township has seen 90,000-pound trucks and it is only going to get worse as brownfields are being reclaimed.
- g. The intersection of PA 512 and US 22 needs to be improved.
- h. One item to explore is alternative routing. Specifically, look at the option of colored routes around the city.
- i. One relief point for PA 512 congestion may be an additional exit ramp near Township Line Road in Bethlehem; this may relieve traffic pressure from the industrial park.
- j. Increased dynamic messaging along US 22 should be permanent.

<b>Date</b>	June 19, 2018
<b>Time</b>	8:00 AM
<b>Location</b>	LVPC, 961 Marcon Blvd. #310, Allentown, PA 18109
<b>Meeting Name</b>	LVIA Area Freight Study: Economic Development Stakeholder Roundtable

**Meeting Purpose:** Offer economic development stakeholders the opportunity to provide input on local freight trends, anticipated land developments, existing freight bottlenecks, and capital improvements needed to address freight impacts.

### **Summary of Stakeholder Input**

#### ***What are some of the observed trends and issues related to freight and economic development?***

- a. Developers and communities are dealing with truck traffic. There are residential areas with older roads that were not built for high volume. The intermingling of freight with regular traffic creates poor conditions.
- b. In recruiting business development to the region, there hasn't been much feedback within the study area as compared to the rest of the region. Labor is an issue. If the Lehigh Valley is to attract more workers, there needs to be places to live.
- c. There is a need for road enhancement but there is also the issue of private property rights and acquisition of right-of-way.
- d. There needs to be municipal cooperation. Allen Township is a good example; they want to be a good partner. They have been communicating what they need for their community and what is beneficial for the region. Other townships aren't as vocal.
- e. Revenue at the federal and state levels can present challenges. Municipalities can't be enticed to do something without a carrot. Dealing with the state budget is a challenge, regardless of the agency.
- f. Most recently with DEP, there have been environmental regulations that have been tricky. In Northampton County, the conservation district reports to DEP that there is a lack of direction as to how they handle certain things. The developer lost 6 months of advancement and construction over this issue and the developer was the one forcing the issue.
- g. The relationship and coordination between developers and PennDOT District 5-0 and Central Office had issues on the ROW side. In reviewing plans, the developer would receive direction from District 5-0 and follow it, only to receive conflicting comments from Central Office. PennDOT wasn't speaking with one voice.

- h. Is there political will for certain infrastructure improvements to come to fruition? For example, if a bypass around Bath Borough was proposed, would municipalities be willing to enact eminent domain for the greater good?
- i. FedEx's question prior to selecting the Lehigh Valley was "where don't we have traffic?" There are groups now coming out against FedEx's development.
- j. The state legislator's office hears from constituents regarding traffic concerns because so much work has been done over the years (e.g., major bridge replacements). People in the legislator's jurisdiction don't remember what life was like prior to construction.
- k. If municipalities want to be protected from development impacts, transportation improvement funding should be targeted where development is intended to occur. Focus on channeling commerce to those "on-the-way" developments and less on prepping land for future development.
- l. LVPC only invests in areas where there is existing growth. They have a structurally deficient bridge problem and the counties jointly own a series of bridges that need improvements. The counties can't close all 3 bridges spanning the Lehigh River at once and they are doing everything they can to move money with PennDOT to improve those facilities. LVPC is working collaboratively with the counties and PennDOT to figure out what infrastructure they need to plan for, where signal retimings should occur, etc.
- m. Two big developments in the study area are about to advance and Weaversville Road is not prepared for the additional truck traffic. The ongoing question is, should vehicles and trucks be routed toward PA 33 or to US 22? The problem with the PA 329/248 scenario is a huge swath of that area is not marked for development. There is also high residential growth, so it's not only truck traffic concerns.
- n. Every time a new warehouse or logistics center/large employer is planned, LVPC notifies LANTA. LANTA reaches out to the company to coordinate a fee-for-service schedule. Unfortunately, it isn't feasible to run transit lines to every single cluster of businesses. LANTA's executive director is working with Uber on a shared-ride agreement to help close mobility gaps.
- o. Allen Township is requiring developers have a location for a LANTA stop so the transit provider can safely drop off and pick up.
- p. The farther north in the study area, the less sense it makes from an economic development standpoint.
- q. With respect to labor, it is outside the domain of this study but developers are looking for the experience that the Rockefeller Group has had. Spec builders want to be able to get workers to their sites. It is an existential question as to whether the Lehigh Valley wants to compete for these developers.

- r. LVPC has identified growth areas in their county comprehensive plan, which is being updated now. It is known that one of the townships in the region wants zero development. If that municipality bans development, it will leapfrog further north. It is important that small boroughs are positioned to have restaurants and other service-type businesses to support other industries.

### Appendix F: Municipality Act 164 Status

Municipality	Lehigh Valley (ABE)	Queen City (XLL)	Braden (N43)
Allen Township	N		
Bethlehem Township	N	Unconfirmed	Unconfirmed
Bushkill Township	N	Unconfirmed	Unconfirmed
Catasaqua Borough	Y		
City of Allentown	Y	Y	
City of Bethlehem	Y		
Coplay Borough	N		
East Allen Township	N		
Emmaus Borough		Y	
Forks Township			Y
Hanover-Lehigh County	N		
Hanover-Northampton County	Y		
Lehigh Township	N		
Lower Macungie Township	N	N	
Lower Nazareth Township	N	Unconfirmed	Unconfirmed
Lower Towamensing Township	N		
Moore Township	N	Unconfirmed	Unconfirmed
Nazareth Borough	N	Unconfirmed	Unconfirmed
North Catasaqua Borough	N		
North Whitehall Township	Y		
Northampton Borough	N		
Palmer Township	Y		Y
Plainfield Township			N
Salisbury Township	N	N	
South Whitehall Township	N	N	
Stockertown Borough			N
Tatamy Borough			N
Upper Macungie Township	N		
Upper Nazareth Township	N		N
Walnutport Borough	N		N
Washington Township	Y		
Whitehall Township	Y		
*The City of Easton has not adopted Act 164			

Source: LNAA

## Appendix G: Transportation Development District Overview

Establishing a Transportation Development District (TDD) is one potential tool to help fund future transportation infrastructure improvements. While TDDs are not common in Pennsylvania (based on research conducted for this study), a TDD can be effective when combined with other financing tools and leveraged with other state and federal funding sources.

This section provides an overview of TDDs—why the tool was developed, how a TDD is established, and a few takeaways from municipalities that have used the tool to help finance transportation projects.

### **What is a Transportation Development District (TDD)?**

A Transportation Development District (TDD) is a specific area or designated areas established to plan, finance, acquire, develop, construct, and operate a planned program of transportation projects.

#### *Why were TDDs established?*

In 1985 the Pennsylvania General Assembly recognized that transportation facilities and services were either not available or not adequate to support the community and economic growth of Pennsylvania communities. Specifically, federal, state, and local funding is not always available for communities to keep pace with transportation needs. Recognizing the gap between community/economic growth and funding, the legislature enacted the Transportation Partnership Act (TPA) (P.L. 287, No. 47). The TPA enables the creation of Transportation Development Districts (TDDs) to fund transportation projects.

The act encourages municipal and private sector cooperation "to provide funding for transportation projects in areas where economic growth and development has made the transportation facilities and services inadequate." (Section 1.1(b) of the Act)

#### *How is a TDD Established?*

A municipality or municipal authority establishes a TDD, either alone or jointly with other municipalities or municipal authorities. The governing body of the municipality or municipal authority designating a TDD has the authority to exercise all powers otherwise granted by law in order to plan, finance, develop, improve, or operate any transportation facilities or services.

#### *Eligibility Conditions*

- Municipal authorities are required to obtain permission from the municipalities they serve before either establishing or joining in a TDD designation.
- A TDD may not be established for the purpose of maintaining or repairing an existing facility.
- All properties that have a substantial relationship to the proposed transportation facility/service are considered to benefit from the facility/service and should be included in the TDD.

#### *Paying for TDD Projects*

Transportation projects within a TDD may be funded and financed using one of the following five methods:

1. Imposing a fair and reasonable assessment (tax) upon *business property* located within the district per the requirements of the Business Improvement District Act of 1967 (P.L.658, No.305; sections 2(2) through (5), 3 and 4).
2. Imposing a fair and reasonable assessment (tax) on *each benefited property* within the TDD based on methodology adopted by the municipality. The methodology is based upon actual or projected use of each transportation project by each property within the district. No exceptions, exclusions, or preferences are granted to any property.
3. Imposing a tax to subjects of taxation located within a transportation development district and restricting the tax receipts to the financing of transportation projects. Such transportation districts must be within a “deteriorated area” as defined by the Local Economic Revitalization Tax Assistance (LERTA) Act of 1977 (P.L.237, No.76, section 4(a)).
4. Issuing notes and bonds and entering into leases, guarantees, and subsidy contracts pursuant to the provisions of the Local Government Unit Debt Act of 1972 (P.L.781, No.185), or in the case of a municipal authority, pursuant to the provisions of the Municipality Authorities Act of 1945 (P.L.382, No.164).
5. Accepting grants, gifts, and donations.

### Transportation Planning Required to Establish a TDD

#### *Planning Study*

Municipalities or municipal authorities establishing a TDD are required to complete a comprehensive study, per federal, state, and regional standards for integrated transportation planning and programming, to determine a program of projects to be advanced within the TDD. The study identifies the beneficiaries of all projects and includes an analysis of cost allocation according to projected benefits. Two types of transportation projects may be financed: facility projects and service projects.

#### Transportation Facility Projects

Allowable transportation facility projects include any public highway or passenger transportation system, including but not limited to:

- Local streets, roads, sidewalks, alleys, passageways, traffic-control systems, structures, roadbeds, railroads, buses, trolleys, subways and other equipment for public passenger transportation, guideways, elevated structures, buildings, stations, terminals, docks, shelters, waterways, ferryboats, airports, and parking areas for use in connection with any of the preceding;
- Tunnels, systems for connecting transportation routes or corridors, and rights-of-way;
- Communication systems, equipment, furnishings, paving, or any other materials required for any of the preceding; or
- Any fractional or undivided co-ownership interest in any one or a combination of any of the foregoing that may be deemed by the municipality or municipal authority to be necessary and desirable.

A transportation facility project cannot include the maintenance or repair of existing facilities.

### Transportation Service Projects

Allowable transportation service projects include:

- Any system of public passenger transportation by any mode and salaries and associated costs;
- The provision of any system of public highway transportation and salaries and associated costs; and
- Any method by which a municipality or municipal authority provides, plans for, implements, undertakes, or otherwise makes available to the public transportation facilities.

### *Multiyear Transportation Improvement Program and Financial Plan*

Municipalities or municipal authorities establishing a TDD develop a multiyear transportation improvement program and financial plan. The multiyear transportation improvement program identifies priorities and provides a schedule for transportation facilities to be constructed or transportation services to be offered.

The financial plan must include projects by funding source and use and requires submission to municipal, county, and regional planning commissions for approval.

Any TDD projects that affect the state highway system should be coordinated through the county's transportation improvement program and the regional planning commission—and ultimately with PennDOT—for review, approval, and consolidation into the regional transportation plan and program.

### Enabling Ordinance

A TDD-enabling ordinance specifies the location of the TDD, the proposed projects to be accomplished, and associated costs. Costs may include but are not limited to: the transportation project; engineering, architectural, legal, or other consulting fees; and financing costs. A public hearing is required to enact the ordinance.

If property owners within the proposed TDD with an assessed property valuation of more than 50 percent of the total TDD property valuation file a written protest against the ordinance, it cannot be enacted.

### Termination of a TDD

A TDD shall not be terminated until:

- The proposed transportation projects have been completed or canceled by the governing body of the municipalities or municipal authorities designating the TDD.
- The municipalities or municipal authorities have paid and satisfied all notes, bonds, or other obligations issued and or agreed upon.
- Municipalities that have jointly designated a TDD may terminate the designation only upon action by all municipalities. Similarly, municipal authorities that have jointly designated a TDD may terminate the designation only upon action by all municipal authorities.

### TDD Experience of Pennsylvania Municipalities

While TDDs are not a common transportation project funding and financing tool within Pennsylvania, the tool has been used to varying degrees of success and is often layered with other tax-enabling legislation. This section discusses experiences of a few municipalities that have established TDDs and identifies TDD benefits and challenges. It is not a comprehensive listing of municipalities that have enacted or have considered enacting a TDD.

Due diligence from Internet research was combined with discussions including municipal officials and professionals representing the following municipalities: Moon Township, Allegheny County; Town of McCandless, Allegheny County; Washington County; Ferguson Township, Centre County; Springfield Township, Mercer County; and East Pennsboro Township, Cumberland County.

#### *Moon Township, Allegheny County*

Moon Township through the Moon Township Transportation Authority (MTA) has financed and constructed three new interchanges and several connector roads since it was established in 1987. The MTA has successfully combined the use of a TDD and LERTA district. LERTA is one of the five methods used to fund projects in a TDD per the Transportation Partnership Act (TPA). In effect the amount of tax abatement received through LERTA is voluntarily applied by property owners to finance construction of improvements within a specified district. At a high level, the mechanics for this methodology include the following.

- Properties within the designated transportation district are exempted from local taxes on the value of new buildings or improvements to commercial properties for up to 10 years, per LERTA.
- Participating property owners “contribute” funds (their LERTA tax abatement) to the MTA in the like amount of exempted taxes to facilitate specific transportation projects. “Contribution” includes grants, gifts, and donations as defined in the TPA.
- Projects include any eligible construction, reconstruction, or improvement for which a building permit is issued on or before a specified time in the designated district.
- When all transportation facility projects are completed, a terminating ordinance is adopted and the LERTA ordinance becomes null and void.

Moon Township’s LERTA ordinance, in which the TPA is referenced, is granted authority through several statutes:

- Local Economic Revitalization Tax Assistance Act, 72 P.S. §4722 et seq., as amended.
- Transportation Partnership Act, 53 P.S. §1621 et seq., as amended.
- General Local Government Code, 53 Pa.C.S.A. §101 et seq., as amended.
- Municipality Authorities Act, 53 Pa.C.S.A., Chapter 56, as amended.
- Second Class Township Code, 53 P.S. §65101 et seq., as amended.
- Urban Redevelopment Law, 35 P.S. §1701 et seq., as amended.
- Neighborhood Improvement District Act, 73 P.S. §831 et seq., as amended.
- Neighborhood Assistance Act, 62 P.S. §2081 et seq., as amended.

*Town of McCandless, Allegheny County*

Similar to Moon Township, the Town of McCandless (McCandless) has used a TDD through a companion LERTA program. Under the Business and Taxation section of municipal codified ordinances, McCandless has established a Revenue Allocation Program (RAP) Ordinance. The ordinance is granted authority through several statutes:

- Local Economic Revitalization Tax Assistance Act, the Act of December 1, 1972, P.L. 237, No. 76, 72 P.S. Sec. 4722 et seq.
- Transportation Partnership Act, as the same may be amended, the Act of July 9, 1985, P.L. 189, No. 47, 53 P.S. Sec. 1621 et seq.
- The Business Improvement District Act, the Act of November 30, 1967, P.L. 658, No. 305, 53 P.S. Sec. 1551 et seq. (BIDA).
- The Home Rule Charter and Optional Plans Law, 53 P.S. Sec. 1-101 et seq. (HRCOPL).
- The Act relating to Inter-Governmental Cooperation, 53 P.S. Sec. 481 et seq.
- The Public School Code of 1949, 24 P.S. Sec. 1-101 et seq. (Ord. 1076 Sec. 2. Passed 7-20-92.)

The ordinance establishes an “eligible area” known as the “McCandless Economic Development District” which meets the definition of deterioration required under LERTA. Application of the RAP is limited to the eligible area. Properties located in the eligible area are considered “benefitted properties” per TPA, BIDA, Municipalities Authorities Act (MAA) (53 P.S. Sec. 301 et seq.), or HRCOPL.

The ordinance further establishes “contribution” as a voluntary taxpayer payment within the eligible area for McCandless’ use in developing public infrastructure facilities projects or services. “Contribution” includes grants, gifts, and donations as defined in the TPA, BIDA, or MAA.

Property owners within the eligible area and who make improvements to property apply for and receive an exemption under LERTA after receiving a building permit for improvements verified by both the municipality and school district. The abatement application includes language referencing the property owner’s desire to participate in the Tax Abatement Program for the purpose of financing the expenses to be applied toward the construction of the McCandless Economic Development District Improvements.

McCandless has also used Transportation Impact Fees authorized under the Pennsylvania Municipalities Planning Code (MPC) to finance transportation projects. The TDD was found to be more complicated to implement; the Transportation Impact Fee is more prescriptive, making it easier to implement. Transportation Impact Fees charge a one-time fee with the fee amount based upon an estimate of the share of program and improvements, whereas a TDD is built on a program of improvements.

McCandless also faced legal challenges when it sought to deploy “imposing a fair and reasonable assessment on each benefitted property within the TDD by way of a formula adopted by the governing body” as a method to finance TDD projects. The municipality carefully crafted methodology to derive an assessment based upon actual or projected usage by each property within the district of the transportation facilities or services to be financed. While the methodology was not overturned legally, it was reported that the use of LERTA to finance a TDD was easier to explain and obtain buy-in from property owners and local taxing bodies as compared to developing a fair and reasonable assessment methodology to finance a TDD project.

### *Washington County*

Washington County established a RAP through resolution in 1993 for portions of 13 municipalities. Similar to Moon Township and the Town of McCandless, the RAP program contribution is a payment made voluntarily by a taxpayer whose property is within a defined eligible area to a trust fund administered by the County Authority to develop public infrastructure facilities projects or services.

### *Ferguson Township, Centre County*

In the early 1990s Ferguson Township began studying the feasibility of implementing a TDD to fund necessary transportation improvements. The township is 50 square miles and includes a growth area of 10 square miles adjacent to State College Borough, home to Penn State University. Through the planning study conducted as part of implementing a TDD, property owners in the proposed district were assigned assessments based on developed methodology. After nearly a decade of working with property owners and taxing bodies, the political will was not in place to pass the TDD. It was reported that the development community was effective in discouraging property owners from adopting the TDD.

While the TDD was not adopted, Ferguson Township utilized the land use planning work conducted for the TDD as baseline information for trip forecasting. The Township determined that a dedicated revenue stream to fund the significant transportation improvements associated with growth in and around State College needed to be identified. In doing so the Township ultimately chose to raise three Township taxes (real estate, earned income, and real estate transfer) to help fund transportation improvements. The Township leverages these increased tax revenues with state funding and impact fees to fund transportation improvements.

### *Springfield Township, Mercer County*

Similar to Ferguson Township, Springfield Township in Mercer County considered using a TDD to finance transportation improvements and opted instead to use a different financing tool. Springfield Township is home to a sizable retail outlet mall located adjacent to I-79, four miles south of I-80. The Township evaluated the use of a TDD to finance transportation improvements surrounding the retail area but opted to use Tax Increment Financing (TIF) as an alternative. The key consideration was property owner concern about paying an assessment on vacant land.

### *East Pennsboro Township, Cumberland County*

East Pennsboro Township's Partnership Highway Improvement Ordinance was challenged by a statewide trade association and local builders. The ordinance was challenged based on the "fair and reasonable assessment methodology" used to determine benefitted properties. The ordinance was enacted in 1987 to fund a 10-year capital improvement program for construction of township roads. The entire township was designated a TDD because it was determined that all properties within the township would benefit from TDD implementation. The ordinance required new property owners to be assessed based on the projected benefit the new property owners would receive from the Township's highway improvement program. The contribution from existing property owners, however, was obtained from the Township's general revenue funds and not from an assessment levied against the existing property owners based on their actual or projected usage of the planned projects. Since the TPA requires all benefitted properties be assessed fairly and reasonably based on the actual or projected usage of the projects, it was determined that the Township's method of determining a fair and

reasonable assessment for properties within the TDD violated the Transportation Partnership Act. The Township repealed the ordinance in 2009.

## General Observations about TDDs

### *Reported Barriers to TDD Implementation*

#### 1. Assessing Vacant Land

The Transportation Partnership Act enables five ways to fund a program of projects identified within a TDD. One of those ways is imposing a fair and reasonable assessment on every property within a TDD. Because assessment under a TDD is levied on all benefitted property owners, owners of vacant land are required to pay the assessment up front, before projects are constructed. Obtaining property owner buy-in for the assessment has been challenging for several municipalities. If property owners within the proposed TDD with a total assessed property valuation of more than 50 percent of the total TDD property valuation oppose the TDD, a TDD cannot be enacted.

Unlike a transportation financing tool such as a Transportation Impact Fee, a TDD is an annual assessment rather than a onetime fee. Annual assessments must be applied to undeveloped property which creates an issue with the land owners paying for transportation improvements before they sell or develop their property. Alternatively, an impact fee is only paid when the land is developed. It was reported that one way in which attorneys working on behalf of TDDs have addressed this issue is to propose that assessments accrue over time and are held until property is sold. This ensures the municipality will receive funding in the future without the property owner actually paying an annual assessment.

#### 2. Assessment Methodology Challenges

Imposing a “fair and reasonable” assessment on a TDD should be approached with some caution based on experiences in other communities. Imposing a fair and reasonable assessment requires the municipality to develop a formula based upon the actual or projected usage of the new transportation facilities by each property within the district. The fairness of the methodology for calculating benefit in an equitable manner has been legally challenged.

In the case of McCandless, the methodology prepared and adopted by the Township was upheld. In the case of East Pennsboro Township (Cumberland County), the courts determined that the adopted methodology was unfair to new property owners compared to existing property owners. The TDD ordinance was eventually repealed.

#### 3. Complexity and Costs to Establish

The TPA legislation has been found to be somewhat vague and not as definitive as legislation developed for Transportation Impact Fees. Explaining the benefits of a TDD to property owners and taxing bodies can be challenging and has been found to be a limiting factor.

It requires time and money to conduct the transportation planning studies required to establish a TDD, as well as a Transportation Impact Fee program per the MPC. Variables include the scope of the study area, including the number of roads and intersections. Planning, engineering, and legal fees are reported to be sizable and upwards of \$50,000.

### 4. Property Owner Support

The use of any type of financing requires clear community support. Property owners located within a TDD, or LERTA or TIF district, need to clearly understand and be on board with benefits and implications associated with using the financing tools. Ferguson Township found that the lack of political will, reportedly driven by developers and land owners, put a halt to a nearly decade-long push for a TDD. Instead, the municipality opted to raise taxes to help fund necessary transportation infrastructure improvements.

TDD legislation has a provision that if TDD formation is opposed by property owners whose land totals more than 50 percent of the assessed land value in the proposed district, a TDD cannot be formed. Therefore, meeting with taxing authorities and property owners upfront and throughout the process is critical. Practitioners using the tool found that other tools were easier to explain to property owners and enact.

### Benefits of a TDD

#### *Combining with LERTA*

Several municipalities have successfully financed transportation projects by combining a TDD and LERTA. Moon Township has been particularly effective in doing so. Properties within a designated LERTA/TDD district are exempted from local taxes on the value of new buildings or improvements to commercial properties for 10 years. Property owners who participate in the program contribute funds to the transportation authority in like amount of the tax abatement. The contributions are used for the construction of identified transportation projects. The benefit is that TDD assessments are paid for through use of diverted tax revenue rather than a new fee being imposed on the landowner.

Note that in using LERTA in combination with a TDD, a municipality must identify an area as “deteriorated.”

#### *Assessment on Non-Profits*

A TDD allows a municipality to assess funds on non-profits, while tools such as a Transportation Impact Fee do not.

#### *Borrow Funds for Transportation Improvements*

Once approved a TDD levies an annual assessment to currently used and vacant land. It allows a municipality to borrow funds to construct infrastructure improvements within an established time limit.

### Alternative Transportation Financing Tools

A few municipalities have explored the use of a TDD to finance transportation improvements but opted to use alternative financing options. The following tools/sources for financing transportation were identified.

- Transportation Impact Fees
- Tax Increment Financing
- LERTA

- Municipal tax increases (real estate, earned income, real estate transfer)
- Pennsylvania Infrastructure Bank (PIB) – low-interest loans used to accelerate priority transportation projects and spur economic development.

### Leveraging with Other Financing Tools

On its own, a TDD will not generate enough funds to fully cover the costs of transportation improvements. While a TDD can generate revenue through assessments, realistically it can only fund a portion of the costs of a transportation project. Therefore, the revenues generated need to be combined with state or other federal funds.

### Appendix H: Acronyms and Definitions

**AADT** – Annual Average Daily Traffic

**Act 31 of 2018** – An act by the Pennsylvania General Assembly amending Title 75 of the state’s Vehicle Code, providing for the length and width of vehicles on operation of certain combinations on interstates. The total outside width of a vehicle, including any load, shall not exceed eight feet *six inches* except as otherwise provided for.

**CRFC** – Critical Rural Freight Corridor, a component of the larger NHFN

**CUFC** – Critical Urban Freight Corridor, a component of the larger NHFN

**DEP** – Department of Environmental Protection

**DU** – dwelling unit

**FAF** – Freight Analysis Framework

**FAST Act** – A 5-year funding and authorization bill governing federal surface transportation spending. Congress passed the act in December 2015.

**FHWA** – Federal Highway Administration

**FTA** – Federal Transit Administration

**GIS** – Geographic Information System

**HCM** – Highway Capacity Manual

**INRIX** – Transportation data company specializing in transportation analytics from real-time anonymous mobile phones, connected cars, trucks, and other fleet vehicles

**ITE** – Institute of Transportation Engineers

**LANTA** – Lehigh and Northampton Transportation Authority, the region’s primary provider of public transportation services

**LEHD** – Longitudinal Employer-Household Dynamics

**LNAA** – Lehigh Northampton Airport Authority

**LOS** – Level of Service, a qualitative measure used to relate the quality of traffic flow

**LRTP** – Long-Range Transportation Plan

**LVIA** - Lehigh Valley International Airport

**LVPC** – Lehigh Valley Planning Commission. The LVPC provides staff and administrative support to the Lehigh Valley MPO, or LVTS.

**LVTS** – Lehigh Valley Transportation Study, the MPO for the Lehigh and Northampton County region

**MAP-21** – Predecessor legislation to the FAST Act; Congress passed the act in July 2012.

**MPC** – Municipalities Planning Code

**MPO** – Metropolitan Planning Organization. For Lehigh and Northampton counties, the MPO is the Lehigh Valley Transportation Study, the organization that controls how state and federal dollars are invested within the two counties’ surface transportation system.

**MSF** – Million square feet

**NHFN** – National Highway Freight Network, a federally-designated highway network eligible for federal freight funding and grants. It is a subset of the larger National Multimodal Freight Network (NMFN).

**NHS** – National Highway System

**PennDOT** – Pennsylvania Department of Transportation

**PFFS** – Percent Free Flow Speed

**RITIS** – Regional Integrated Transportation Information System

**RMS** – Roadway Management System, a PennDOT-owned inventory of Pennsylvania’s state-owned highway network, its conditions, and characteristics.

**ROW** – Right-of-way

**SR** – State Route

**TDD** – Transportation Development District

**TIP** – Transportation Improvement Program

**TIS** – Traffic Impact Study

**Trip Distribution** – The second step in the traditional four-step transportation forecasting model. It is a model of the number of trips that occur between certain origins and destinations. Succeeding steps include mode choice (what mode travelers use), and route assignment (selection of routes).

**Trip Generation** – The first step in the traditional four-step transportation forecasting model. It focuses on the social and economic attributes of a parcel and its ability to produce or “generate” trips.

**UPWP** – Unified Planning Work Program





**Contact Information:**

**Brian Funkhouser, AICP, Project Manager**  
**4431 North Front Street, 2<sup>nd</sup> Floor**  
**Harrisburg, PA 17110**  
**(717) 213-6236**  
**[Brian.funkhouser@mbakerintl.com](mailto:Brian.funkhouser@mbakerintl.com)**